THE IRON TRADE REVIEW

Volume XLIX CLEVELAND, JULY 20, 1911 Number 3

Mill Operations Show Some Improvement

But General Situation Has Changed Little—Heavy Tonnage of Basic Contracted For by Republic Iron & Steel Co.

Mill operations show some increase and there is more activity in pig iron in some centers, but the improvement in the general situation is very moderate. The Steel Corporation is operating 70 per cent of its total capacity. In the east, mills are about keeping up to their previous gait and are hoping for improvement, owing to promises of activity in shop building and other lines. The Cambria Steel Co. is now operating all its blast furnaces and 23 of its 25 open-hearths. The Bessemer department is not so active. The Republic Iron & Steel Co. now has in operation all of its blast furnaces in the Sharon, Pa., district, and will shortly start up two additional open-hearth furnaces.

Pig Iron

The most important deal in pig iron pending during the past week was for 60,000 tons of basic by the Republic Iron & Steel Co. Terms have practically been agreed upon for getting this iron from a valley furnace, which will take ore from the Republic. The American Rolling Mill Co. has purchased 15,000 tons of basic from companies along the Ohio river and two Pittsburg buyers bought 4,000 tons at low prices. The price of basic seems to be somewhat firmer, but $13, valley, is an ordinary quotation. A maker of pneumatic tools in New Jersey has purchased 5,000 tons of foundry grades. A cast iron pipe maker has purchased 3,000 tons in the eastern territory and a leading cast iron pipe company is in the market for a round tonnage.

Railroad Buying

Eastern railroads are showing more willingness to specify, especially on track materials, but the volume of new business is not large in that section. The American Bridge Co. has taken contracts for the Sibley bridge for the Sante Fe railroad, across the Missouri river, 9,900 tons, and 1,700 tons for bridge work for the Detroit, Toledo & Ironton. The Chesapeake & Ohio has ordered 7,000 tons of rails from the Illinois Steel Co., and the Mexico & Northwestern 3,000 tons of plates from the same company. The Ann Arbor has ordered 400 steel underframe box cars and 100 automobile cars from the Western Car & Foundry Co. The Canadian Northern has ordered 200 box cars from the Canadian Car & Foundry Co. Orders placed by the Intercolonial railroad in Canada amount to $500,000.

Iron Ore

Reports are current of sales of Lake Superior iron ores at reductions below the regular quotations. These reports are attributed to deals in resale ore. Furnace interests are showing more disposition to cover and some sales of fair size have been made at Cleveland recently. The lake situation is still very unsatisfactory for vessel men.

Bars, Plates and Sheets

It is estimated that 95 per cent of the agricultural implement makers in the Mississippi valley have contracted for their requirements in steel bars. The usual price is 1.25c, but 1.20c is done on competitive business. Competition on plates and sheets is keen and mills are very anxious to book orders. Four government colliers will require about 22,000 tons of plates. On 11,000 tons of cast iron pipe for the city of Detroit, R. D. Wood & Co. were the lowest bidders. The leading interest has taken contracts amounting to about 2,000 tons.

Structural Material

Contracts for structural material during the first half of the year are estimated at from 600,000 to 700,000 tons, which is considered a fairly good total. The prospects for the last half of the year are that a larger tonnage will be booked. The American Bridge Co. has taken a contract for 5,000 tons for the Chicago Telephone building and 1,000 tons for a building at Broadway and Thirty-third street, New York. Bids on the new City Hall at Cleveland, which will require about 4,000 tons, have been submitted. The lowest bid was $39.85 per ton, delivered.

Pig Iron Stocks

Pig iron stock statistics of the Pittsburg Valley and Ohio territory show a decline of 11,000 tons during the first half of July. Among steel works and merchant furnaces other than the steel corporation, practically all decreased. Foundry grades have total stocks in that district now of about 880,000 tons. This showing is the most favorable in several months despite shut downs over the Fourth. In the last half of June, these stocks increased 23,000 tons.

WORLD'S IRON MARKETS

PITTSBURG

Important Deals in Pig Iron—Fair Conditions in Finished Lines.

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg., July 18.

New business in crude and finished steel is being handled quietly, and, while actual bookings are not quite so heavy as a few weeks ago, specifications are satisfactory and the iron trade as a whole continues to make a fairly good showing considering the season of the year. That the falling off in orders and specifications during the first two weeks of July, usually the dullest month of the year, as far as the steel industry is concerned, has not been so heavy as expected, is evidenced by the fact that mill operations show little change as compared with the last half of June. The Cambria Steel Co., Johnstown, Pa., is operating all of its eight blast furnaces and 23 of its 25 open-hearth steel furnaces, but operations in other departments are being conducted on a lower schedule. The Republic Iron & Steel Co. is running practically full this week, and will start two remaining open-hearth furnaces at its new steel works in the Youngstown district probably next week. Most of the steel companies in this territory now feel confident that the record for July will exceed that of May in point of orders entered on mill books, and that still further improvement can be expected about Aug. 1. Additional contracts for steel bars have been placed and the bar department of one of the large companies in this territory reports a heavy gain during the first 15 days in July, as compared with the same period last month. On account of the increased buying of sheets in June and the liberal specifications received during the past two weeks, the American Sheet & Tin Plate Co. has found it necessary to start additional mills this week. Ninety per cent of the new business in sheets is for prompt shipment as stocks in consumers' hands are low. Rail mills continue to operate at about the same rate as in June, and a large amount of structural steel work is appearing. Demand for plates, shafting, wire products and pipe is only fair. A large amount of pig iron is known to have changed hands and pending inquiries involve heavy tonnages, but the secrecy surrounding recent transactions indicates that low prices are still being made. The railroads have realized better prices on their July offerings of old material and we quote slightly higher prices on some grades of scrap.

Pig Iron.—A large independent steel company with works just west of Pittsburg is reported to have practically closed today for a round tonnage of basic pig iron, but details have not yet been disclosed. Recent inquiries involving extremely heavy tonnage have not resulted in any material improvement in the local situation. It is known that a large amount of pig iron has changed hands in this territory during the past three or four weeks, but conflicting statements are made as to the tonnage involved and prices paid. Owing to the secrecy surrounding recent transactions buyers are not quite satisfied that extremely low prices established recently have entirely disappeared and as a result considerable tonnage is being held up. A car wheel interest has purchased 1,200 tons of malleable iron for last half shipment at $13.25, valley. One local interest reports a sale of 500 tons of this grade at $13.50, valley. Bids have gone in on 6,000 to 7,000 tons of basic for the Colonial Steel Co.; a round tonnage of foundry grades for the Westinghouse Electric & Mfg. Co, and other inquiries noted during the past two weeks. It now develops that two local consumers picked up a total of about 4,000 tons of basic last week at a low price. One seller is known to have disposed of a large amount of foundry grades, and reports of low prices are heard, but details of these transactions are withheld. It is understood that stocks of foundry iron in the hands of merchant furnace interests have been materially reduced. Only three merchant valley furnaces are running on basic and only one furnace is understood to be piling Bessemer iron. Consumers are taking shipments in a satisfactory manner. The Republic Iron & Steel Co. has relighted its Hall furnace in the Sharon, Pa., district. We quote the market as follows:

(Prompt Shipment.)

Bessemer, valley	$15.00
Bessemer, Pittsburg	15.90
Basic, valley	12.75
Basic, Pittsburg	13.65
No. 2 foundry, Pittsburg	14.40
Gray forge, Pittsburg	13.90
Malleable, Pittsburg	14.15

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Ferro-Alloys.—No important sales of ferro-alloys have been reported and inquiry is extremely light. Prices have not been thoroughly tested.

We quote ferro-manganese at $36.50 to $36.75, Baltimore, for prompt and forward delivery. The freight rate from Baltimore to Pittsburg is $1.95 per ton.

Fifty per cent ferro-silicon is quoted at $52.75 to $53.75, Pittsburg, for prompt and forward delivery; 12 per cent, $25; 11 per cent, $24; 10 per cent, $23, f. o. b. Jisco and Ashland furnaces. The freight rate to Pittsburg is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

Plates.—A number of small inquiries for plates have come out during the past 10 days and competition for this business is very keen. While mill operations are about the same as last month, practically all plants could handle a much larger tonnage and there is evidence that price concessions have been offered, although the market is quotable at 1.35c, Pittsburg. Encouragement is found in the fact that a large number of cars are being figured upon, but the railroads are slow in closing. It is expected that definite action will be taken the latter part of this week by the Erie Railroad Co. on its inquiry for 3,000 freight cars of various types. It is now announced that the Allegheny County Light Co. will not build the proposed new gas holder in the Pittsburg territory, involving about 4,500 tons of plates, until next spring. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.35c. Extras are as follows, per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.20c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends,

narrowest end being not less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ¼ inch to and including 3-16 inch plate on thin edge, 0.10c; under 3-16 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Sheets.—The increased bookings of sheets in June and the first half of July and liberal specifications against contracts have resulted in the American Sheet & Tin Plate Co. starting several additional mills this week. Some of the independents are operating to capacity. Stocks in consumers' hands are extremely low and it is estimated that 90 per cent of the orders being received at present call for immediate shipment. All of the larger companies are maintaining prices, although concessions are still being offered by some mills on shipments from stock. Contracts are being made with the consuming trade for delivery up to Jan. 1, at today's price. We quote the market as follows, with $1 a ton added as the delivered price in the Pittsburg district:

Blue annealed sheets No. 10 gage 1.50c; black annealed sheets No. 28 gage 2c; galvanized sheets No. 28 gage 3c; painted roofing sheets 1.40c per square for No. 28 gage, 2½-inch corrugation; galvanized roofing sheets 2.55c per square for No. 28 gage, 2½-inch corrugation, f. o. b. Pittsburg.

Tin Plate.—New business in tin plate is light and the market shows a rather spotty condition as regards specifications. Some of the independents are operating full time, while others are operating only part of their mills. While it was generally understood that today's price applied only to business for delivery prior to Oct. 1, most of the larger buyers have contracted for their full requirements to Jan. 1, and in a few instances mills have taken orders for delivery during the first few months of next year. It is expected that the 12 new tin mills of the Jones & Laughlin Steel Co., at Aliquippa, Pa., will be ready for service early in September. We quote the market as follows:

Coke tin plate, 10-pound basis, 14 x 20, $3.70 f. o. b. mill, Pittsburg district.

Rails and Track Material. — Steel rail mills in this territory are operating at about the same rate as in June. Specifications are liberal, and, while new business is mostly for small lots, the aggregate tonnage is fair. No particularly large inquiries have appeared, but local rail manufacturers look for some fairly large inquiries the later part of this month. Demand for spikes and track material is heavier, and, while individual orders for standard railroad spikes are not large, the aggregate tonnage booked this month compares favorably with that of June. We quote the market as follows, the base price on open-hearth rails being 1.34c per pound at the mill:

Fifty-pound and heavier, 1.25c per pound; carloads and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.16c, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburg; track bolts, 2.25c, Pittsburg.

RAILROAD SPIKES.

4½, 5 and 5½ x ⅝	$1.50 to 1.55
3, 3½, 4, 4½ and 5 x ½	.10
3½, 4 and 4½ x 7/16	.20
3, 3½, 4 and 4½ x 3/8	.30
2½ x 3/8	.40
2½, 3 and 3½ x 7/16	.60
2 x ⅜	.80

Steel.—Users of semi-finished steel are accepting heavy shipments against contracts previously placed for third quarter shipment and two or three of the larger companies in this territory expect to operate practically full time during the remainder of the month. The Republic Iron & Steel Co. is arranging to start two additional open-hearth steel furnaces at its new works in the Youngstown district, six of these furnaces having been started last month. This company is operating practically full this week. The Cambria Steel Co., Johnstown, Pa., is operating 23 of its 25 open-hearth furnaces. As most users are covered by contract, there has been little fresh buying during the week. Prices are firm and a few odd lots of forging billets have been sold at a premium, the openly quoted price being $26, Pittsburg. We quote the market as follows:

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $21, with the usual extras for size and analysis, and open-hearth rolling billets, $21. Bessemer sheet and tin bars are quoted at $22, and open-hearth sheet bars are quoted at $22, f. o. b. Pittsburg or Youngstown, with full freight to destination added. Forging billets are quoted at $26, Pittsburg.

Hoops and Bands.—One large company in this territory reports that new business and specifications for hoops are about normal. Several contracts have been placed since July 1, for delivery up to Jan. 1, and in a few instances contracts have been made for 12 months. New demand for bands is only moderate and there is evidence that 1.25c, Pittsburg, has been shaded on business for immediate shipment. We quote the market as follows:

Hoops in carload lots, 1.40c, Pittsburg; in less than carload lots, 1.50c; bands, 1.25c base, with net extras, as per standard steel.

Merchant Bars. — Users of steel bars are specifying liberally against contracts and one or two companies in this territory are operating their steel bar mills to capacity. Notwithstanding the holiday and the fact that many mills were closed during the first week in July, one large company reports that bookings of steel bars during the first 15 days of this month exceeded those of the same period in June. The market is firm at 1.25c, Pittsburg, for forward delivery, although this price has been shaded slightly on orders for immediate shipment. The bar iron market is still very quiet, although some mills will not sell at low quotations established a month ago and are quoting 1.30c, Youngstown, or 1.35c, Pittsburg. No. 2 puddling mill of the A. M. Byers Co. at Girard, O., consisting of 46 furnaces, will be started July 31. Demand for shafting is slightly heavier. We quote the market as follows:

Common iron bars, 1.30c, Pittsburg; Bessemer and open-hearth steel bars, 1.25c; plow and cultivator, 1.25c; channels, angles, zees, tees, under 3-inch, 1.35c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds of a size, 0.35c advance. Cold rolled and ground shafting, 60 per cent off in carloads and 55 per cent in less than carloads, delivered in base territory.

Muck Bar.—There has been no important trading in this market, although small lots of muck bar have been sold at $28.50, Pittsburg. We quote the best grades of muck bar at $28.50 to $29, Pittsburg.

Structural.—Numerous small structural awards have been made since July 1, but definite action has not been taken on several of the larger projects in this territory outlined recently. Steel mills report that the aggregate tonnage involved in orders placed during the first half of July makes a good showing as compared with corresponding periods of other years. Fabricating prices are still very low. The American Bridge Co. has received contracts for 1,700 tons of bridge work for the Detroit, Toledo & Ironton railroad and 1,500 tons for an office building and warehouse for the Eastman Kodak Co., Rochester, N. Y. Plans are being prepared for a proposed new railroad terminal at Cincinnati, which will involve heavy tonnage of steel, estimated at from 100,000 to 150,000 tons, but it will probably be several months before definite action is taken on the project. We quote the market as follows:

Beams and channels, 15 inches and under, 1.35c; over 15 inches, 1.45c; zees, 1.35c; tees, 1.40c; angles, from 3 to 6 inches, 1.35c; over 6 inches, 1.45c; universal and sheared plates, 6¼ inches wide and wider, 1.35c.

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Structural.—Numerous small structural awards have been made since July 1, but definite action has not been taken on several of the larger projects in this territory outlined recently. Steel mills report that the aggregate tonnage involved in orders placed during the first half of July makes a good showing as compared with corresponding periods of other years. Fabricating prices are still very low. The American Bridge Co. has received contracts for 1,700 tons of bridge work for the Detroit, Toledo & Ironton railroad and 1,500 tons for an office building and warehouse for the Eastman Kodak Co., Rochester, N. Y. Plans are being prepared for a proposed new railroad terminal at Cincinnati, which will involve heavy tonnage of steel, estimated at from 100,000 to 150,000 tons, but it will probably be several months before definite action is taken on the project. We quote the market as follows:

Beams and channels, 15 inches and under, 1.35c; over 15 inches, 1.45c; zees, 1.35c; tees, 1.40c; angles, from 3 to 6 inches, 1.35c; over 6 inches, 1.45c; universal and sheared plates, 6¼ inches wide and wider, 1.35c.

Merchant Pipe.—Several oil and gas companies are figuring on heavy tonnage of line pipe, to be laid this fall, and indications are that some fairly large awards will be made next month. The Oklahoma interest, which entered the market recently, has not as yet closed on its inquiry for 80 miles of 4 and 12-inch steel line pipe. Jobbers are specifying a little more freely against contracts for merchant iron and steel pipe, but the market continues quiet. Prices are fairly firm. We quote the following official discounts in carload lots, subject to the usual preferential discount to the larger buyers, merchant pipe, where specified, being offered in from ⅛ to 6 inches:

Iron and Steel Pipe Basing Prices.

	Steel.		Iron.	
		Butt weld.		
	Black.	Galv.	Black.	Galv.
⅜, ½, ⅝ inch.....	72	58	68	54
¾ inch	75	63	71	59
⅞ to 1½ inch.....	79	69	75	65
2 to 3 inches	80	70	76	66
		Lap weld.		
2 inches	76	66	72	62
2½ to 4 inches	78	68	74	64
4½ to 6 inches.....	77	67	73	63
7 to 12 inches.....	75	59	71	55
EXTRA STRONG, PLAIN ENDS.				
		Butt weld.		
⅜, ½, ⅝ inch	69	59	65	55
¾ inch	74	68	70	64
⅞ to 1½ inch	78	72	74	68
2 to 3 inches.....	79	73	75	69
EXTRA STRONG, PLAIN ENDS.				
		Lap weld.		
2 inches	75	69	71	65
2½ to 4 inches.....	77	71	73	67
4½ to 6 inches.....	76	70	72	66
7 to 8 inches.....	69	59	65	55
9 to 12 inches.....	64	54	60	50
DOUBLE EXTRA STRONG, PLAIN ENDS.				
		Butt weld.		
¼ inch	64	58	60	54
⅜ to 1½ inch.....	67	61	63	57
2 to 3 inches	69	63	65	59
DOUBLE EXTRA STRONG, PLAIN ENDS.				
		Lap weld.		
2 inches	65	59	61	55
2½ to 4 inches.....	67	61	63	57
4½ to 6 inches.....	66	60	62	56
7 to 8 inches	59	49	55	45

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

Boiler Tubes.—Conditions surrounding this market are not satisfactory. There is little new business appearing and prices are irregular. We quote the following discounts on steel boiler tubes in carload lots to jobbers:

1¾ to 2¼ inch.....	65
2½ inch	67½
2¾ to 3¼ inch	70
3½ to 4½ inch.....	72½
5 and 6 inch	65
7 to 13 inch	62½

To destination east of the Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburg. Usual extras to jobbers and boiler manufacturers.

Wire Products.—A large portion of the new business in wire products being booked at this time is for forward delivery, buyers realizing that prices are low. Some mills will not quote today's prices for delivery beyond Oct. 1, although some fourth quarter business is understood to have been placed. Since prices were reduced $2 a ton, there has been little, if any, shading in this territory. Wire mills are not running on a very satisfactory schedule. Demand for cut nails is light and prices are only fairly firm. We quote the market as follows:

Wire nails, jobbers' carload lots, $1.80; retailers' carload lots, $1.85; cut nails (western makers), jobbers' carload lots, $1.60; painted barb wire, jobbers' carload lots, $1.80; retailers' carload lots, $1.90, with 30c for galvanizing; plain wire to jobbers in carloads, $1.60, and to dealers, in carloads, $1.65; polished staples, $1.80; galvanized staples, $2.10.

Wire Rods.—Users of wire rods, who are not covered by contract, have purchased from 200 to 500-ton lots for delivery over the next few months at $27, Pittsburg. We quote, $27, Pittsburg, on Bessemer and open-hearth wire rods.

Coke.—The coke market has again quieted down and no transactions of the slightest importance in furnace or foundry coke were negotiated during the week, due to the fact that a large number of furnaces are now idle and that those in operation have already covered for their early requirements. The consumption of coke by non-merchant furnaces shows a slight gain, but the total production and shipments have fallen off considerably, the latter showing a loss of 800 cars, equivalent to about 28,000 tons during last week. Production declined 8,000 tons. Despite the dullness of the market, prices show little, if any, change, and leading sellers of furnace coke are not quoting below $1.50, ovens. The foundry coke market is extremely quiet and no action has been taken as yet on inquiries sent out in June by local consumers who have purchased small lots for early shipment in the open market. Since the strike of the miners in the Irwin-Greensburg, Pa., field was called off, a few weeks ago, a number of the mines and coke ovens have resumed operation. We quote standard Connellsville furnace coke for prompt shipment at from $1.40 to $1.50, ovens, and for second half at from $1.60 to $1.70, ovens. On high grade Connellsville foundry coke we quote from $1.80 to $1.90, ovens, for prompt shipment, and from $2 to $2.40, ovens, for second half delivery. The Connellsville *Courier's* figures for the week ending July 8 show 23,933 active ovens with an output of 267,122 tons, as compared with 23,876 active ovens and a production of 275,950 tons the previous week.

Old Material. — Prices of some grades of old material are somewhat higher this week and shipments to consumers are heavier than for several weeks. There has been no heavy buying on the part of consumers, but dealers have increased their stocks considerably. The July offerings of the railroads in this section brought slightly higher prices than realized in June. Heavy melting steel can still be had at $13, delivered, although a few sales are reported at $13.25. Cast borings are now quoted at $9.25 to $9.50, an advance of 75 cents a ton. Machine shop turnings are quoted at $9.25 to $9.75, an advance of 75 cents a ton. A steel company with works at Youngstown recently bought a round tonnage of bundled sheet scrap and other recent sales have resulted in the price of this grade being advanced to $11.25 to $12, delivered. We quote gross tons, delivered in the Pittsburg district, including Monessen, Sharon, Steubenville, Brackenridge and Follansbee, as follows:

Heavy melting scrap	$13.00 to 13.25
Rerolling rails	13.50 to 14.00
Bundled sheet scrap	11.25 to 12.00
Iron axles	23.50 to 24.00
Old iron rails	15.50 to 16.00
Stove plate	10.50 to 10.75
No. 1 wrought scrap.....	13.50 to 14.00
Old car wheels	12.75 to 13.00
Low phosphorus	16.50 to 17.00
Machine shop turnings	9.25 to 9.75
Cast borings	9.25 to 9.75
No. 1 cast scrap	13.00 to 13.50
Malleable	13.00 to 13.50

CHICAGO

Implement Makers Generally Under Contract for Bars.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, July 18.

Fabricating contracts and rail orders continue heavy and most of the western makers are fairly well sold up on steel bars. It is estimated by a leading authority that agricultural implement makers in the Mississippi valley have made contracts for over 95 per cent of their normal steel bar requirements. Although some of this business was placed on a basis of 1.20c, Pittsburg, the majority of the bar contracts this spring have been made at 1.25c. An independent interest which recently broke away in this market and offered bars at 1.20c found the business well taken and quickly restored its price. Railroads are contributing the majority of the structural tonnage. The Santa Fe has let 9,910 tons to the American Bridge Co. for the Sibley bridge over the Missouri river. Considerable car business has been placed in this territory recently. The Ann Arbor railroad has bought 500 steel underframe cars and the Mexico & Northwestern ordered 3,000 tons of car building material from the Illinois Steel Co. July may make a better record in the wire trade than June. Scrap is still dull.

Pig Iron.—A fair amount of new inquiry appeared during the week and a number of good sized sales were

closed. A Sheboygan, Wis., foundry bought 1,800 tons of southern No. 2 foundry for shipment over the year at $10, Birmingham. A Chicago foundry is in the market for 1,000 tons of southern No. 2 and a southern Wisconsin engine builder is inquiring for 500 tons of southern foundry iron. A local steel manufacturer is in the market for 100 tons of ferromanganese. One of the leading producers of southern iron represented in this market has announced a price of $11, Birmingham, for No. 2 and has recalled all lower quotations. This practically amounts to withdrawing from the market, inasmuch as plenty of iron can be obtained at $1 a ton less. The price of southern iron is now pretty definitely established at $14.35, Chicago, for delivery through the year and sales of northern iron have been made at $14.50, local furnace.

The following prices represent the market for Chicago delivery, except northern foundry No. 2 and malleable Bessemer made in local furnaces, which are quoted, f. o. b. furnace:

(Shipment this year.)

Lake Superior charcoal	$17.00
Northern foundry No. 2	14.50
Southern foundry No. 2	14.35
Southern silveries, 5 per cent silicon	16.35
Jackson Co. silveries, 8 per cent	18.40
Malleable Bessemer	14.50
Alabama basic	14.60

Billets.—There is a moderate amount of business in forging billets and prices are a little better. We quote as follows, f. o. b. Chicago: open-hearth forging billets, $28.60, re-rolling billets, $23.60.

Merchant Bars.—It is estimated by a leading authority that agricultural implement makers in the Mississippi valley have made contracts for over 95 per cent of their normal steel bar requirements. While undoubtedly there was some business placed recently at less than 1.25c, Pittsburg, on account of improved conditions all local mills are holding firm at the present time. Re-rolled hard steel bars have been sold recently at 1.20c, Chicago. There is no further improvement in the iron bar situation and sales are still being made on a basis of 1.20c, Chicago. The leading maker of iron bars reports that orders so far in July are within one per cent of the amount taken during the first half of June. The market on shafting is slightly more active, although no large orders have been placed in this territory recently.

We quote, Chicago delivery, as follows.

Bar iron, 1.20c to 1.25c; hard steel bars, rerolled, 1.20c to 1.25c; soft steel bars and bands and small shapes, 1.43c to 1.48c, base; hoops, 1.63c to 1.68c; smooth finished machinery steel, 1 inch and larger, 1.83c. Shafting 60 per cent off list for carload lots, 55 per cent off for less.

On iron and steel from local stock, we quote, as follows:

Bar iron, 1.80c to 1.90c per pound base; soft steel bars, 1.65c to 1.75c per pound base; soft steel hoops, 1.80c to 1.90c, full extras.

Structural Material.—The structural situation is one of the bright spots in the business at present and fabricating contracts are heavy. Prices on shapes are very firmly maintained at 1.53c, Chicago. Although fabricating orders have increased, the shops have not been able to advance their prices. Practically 16,000 tons of plain material will be necessary to cover fabricating contracts reported let in this market last week. The bulk of the business during the week was taken by the American Bridge Co., which has made a contract with the Atchison, Topeka & Santa Fe Railway for the Sibley bridge over the Missouri river, 9,910 tons, and has also taken 5,085 tons from the Chicago Telephone Co. for a building. In addition to the above, the American Bridge Co. has been awarded 110 tons by the Utah Light & Railway Co. for bridge spans and 195 tons by the Southern California Edison Co. for nine steel transmission towers. Additional fabricating contracts, as reported last week, are as follows: Bridges for the M., K. & T. Ry. Co., 130 tons, to the King Bridge Co.; an addition to St. Joseph's hospital, Denver, 155 tons, to Lowith Bros. Iron Works; transmission poles for the Olympic Power Co., Port Angeles, Wash., 185 tons, to the Hubbard Co., and girder spans for the Great Northern Railway Co., 205 tons, to the Fort Pitt Bridge Works.

We quote, structural material, f. o. b. Chicago, as follows:

Beams and channels, 15 inches and under, 1.53c. For extras, see Pittsburg report.

Plain material out of store is as follows:

All angles, 3 inches and larger, including 6 inches, $1.75 to $1.85 per 100 pounds; angles over 6 inches, $1.85 to $1.90 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.75 per 100 pounds, base; channels, 3 inches and larger, $1.75 per 100 pounds, base.

Rails and Track Fastenings.—Local mills have concluded negotiations with western and northwestern roads, involving a large tonnage. The Chesapeake & Ohio Railroad has ordered 7,000 tons of standard rails from the Illinois Steel Co. It is now reported that the Iowa Central rail order amounted to 3,800 tons.

We quote, light rails, f. o. b. Chicago, and track fastenings, f. o. b. Joliet, as follows:

Light rails, carloads, 40 to 45-pound, 1.16c to 1.20½c; 30 to 35-pound, 1.19½c to 1.24c; 16, 20 and 25-pound, 1.20½c to 1.25c; 12-pound, 1.25c to 1.29½c.

Light section relayers, 45 pounds and under, subject to inspection, $21 to $23; standard section relaying rails, subject to inspection, $23.50 to $24.

Track fastenings, f. o. b. Joliet, angle bars, 1.50c to 1.60c; railroad spikes, 1.65c to 1.75c; smaller size spikes, 1.70c, base; track bolts with square nuts, 2.10c to 2.20c, base.

Plates.—There is considerable car business in the local market. The Mexico & Northwestern Railway has ordered 3,000 tons of car building material from the Illinois Steel Co. The Ann Arbor Railroad has purchased 400 steel underframe box cars and 100 steel automobile cars from the Western Car & Foundry Co. The Canadian Northern Railway has ordered 200 box cars from the Canadian Car & Foundry Co. The Chicago, Burlington & Quincy has placed contracts with the Standard Steel Car Co. for five all-steel 60-foot postal cars and the St. Louis & San Francisco has also ordered eight postal cars from the American Car & Foundry Co. Procter & Gamble Co., Cincinnati, is in the market for 100 tank cars. Mill schedules are very satisfactory and it is probable that considerable more plates will be rolled in Chicago during July than last month.

We quote, mill prices, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches wide, 1.53c. For extras, see Pittsburg report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, 1.75c to 1.85c.

Sheets.—The Inland Steel Co. is operating its 18 sheet mills at full capacity and has an encouraging amount of business on its books. Jobbers are specifying rather freely and consumers are taking out a good tonnage.

For mill prices, see Pittsburg report. Freight to Chicago, 18 cents.

We quote, store prices, f. o. b. Chicago, as follows:

Blue annealed, No. 10, 2c; No. 12, 2.05c. Box annealed, No. 28, 2.65c. Galvanized, No. 28, 3.55c.

Wire Products.—July may make a better record in the wire trade than June, although it is a little early yet for definite predictions. The larger wire mills are limiting their contracts at today's prices to 60 days, although in some cases extensions have been granted.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.88; retailers' carload lots, $1.93; retailers' less than carload lots, $2.03; painted barb wire, jobbers' carload lots, $1.88; retailers' carload lots, $1.93; retailers', less than carload lots, $2.03, with 30c for galvanizing; plain wire to jobbers, $1.68; plain wire, retailers' carload lots, $1.73; staples, bright, $1.88.

Merchant Pipe and Tubes.—Further controversy in the building trades in Chicago is having a disturbing effect on the local market for merchant pipe. Current business in boiler tubes and steel pipe is moderately heavy.

We quote, merchant pipe and tubes, out of store, as follows:

Iron and Steel Pipe Basing Prices.

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛-⅜ inch	69.2	54.2	63.2	48.2
½ inch	72.2	59.2	66.2	53.2
2 in. to 3 in.	77.2	66.2	72.2	61.2
4½-6 inches	74.2	63.2	69.2	58.2
7-12 inches	71.2	54.2	67.2	50.2
Extra Strong Plain Ends.				
¼ inch	70.2	63.2	54.2	52.2
2-3 inches	75.2	68.2	61.2	55.2
7-8 inches	65.2	....	59.2	47.2
Double Extra Strong.				
½ inch	58.2	50.2	....	....
2-3 inches	63.2	55.2	....	....
7-8 inches	53.2	41.2	....	....

Tubes.

	Lap weld steel. Per cent.	Charcoal iron. Per cent.	Shelby seamless. Per cent.
1 inch	39	..	57½
1¼ to 2¼ inch	55	40	35
2¾ to 3¼ inch	62½	50	46

Cast Iron Pipe.—Bids were opened last week at Detroit on 10,920 tons of water pipe and R. D. Wood & Co. are the low bidders, with a local Detroit shop next in order. The contract has not yet been placed. The United States Cast Iron Pipe & Foundry Co. has taken a number of small orders recently, including 700 tons from Flora, Ill.; 400 tons at Council Bluffs, Ia.; 400 tons at Mellan, Wis., and 200 tons at Milan, Mo. The Northern Pacific Railway recently bought a small tonnage of culvert pipe.

We quote, f. o. b. Chicago, as follows:

Four-inch water pipe, $25.25; 6 to 12 inches, $24.50, larger sizes, $24; gas pipe, $1 a ton higher.

Old Material.—The Chicago scrap market shows very little change and prices are practically stationary. Dealers are offering to consumers a heavy tonnage of material, which they purchased about three weeks ago at somewhat higher prices than prevail at present, and in order to move their holdings in many cases will have to make concessions. We note sales of steel angle bars at $10.25, delivered East Chicago. Both iron and steel mills are buying sparingly, having heavy stocks on hand.

We quote the market, for delivery in consumers' yards, Chicago, as follows:

GROSS TONS.

Old car wheels	$12.75 to 13.25
Old iron rails	14.50 to 15.00
Rerolling rails (5 ft. and over)	12.25 to 12.75
Old steel rails (3 ft. and under)	11.25 to 11.75
Frogs, switches and guards	10.25 to 10.75
Heavy melting steel	10.25 to 10.75
Shoveling steel	9.90 to 10.40

NET TONS.

No. 1 R. R. wrought	$11.00 to 11.50
No. 2 R. R. wrought	10.00 to 10.50
Arch bars and transoms	13.50 to 14.00
Knuckles, couplers and springs	10.00 to 10.50
Shafting	15.00 to 15.50
Iron car axles	17.75 to 18.25
Steel car axles	16.00 to 16.50
Locomotive tires	16.00 to 17.00
Dealers' forge	10.00 to 11.00
Pipes and flues	8.00 to 8.50
No. 1 cast	10.75 to 11.25
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boiler cut	7.50 to 8.00
Boiler punchings	12.50 to 13.00
Cast and mixed borings	5.25 to 5.75
Machine shop turnings	6.25 to 6.75
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.25 to 9.75
Angle bars, splices, etc., iron	12.00 to 12.50
Angle bars, steel	10.00 to 10.50
Stove plate and light cast scrap	9.25 to 9.75

More Buying of Ore—Contract For Basic Pig Iron.

Office of THE IRON TRADE REVIEW,
Penton Building, July 18.

Iron Ore.—A number of furnaces have shown much interest in the ore market within a few days and are buying limited tonnages, usually to fill out their mixtures. Reports of standard grades being sold, below regular quotations, are current, but are attributed to resale ore.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $4.50; Mesabi Bessemer, $4.25; old range non-Bessemer, $3.70; Mesabi non-Bessemer, $3.50.

Pig Iron.—The Republic Iron & Steel Co. has about completed negotiations for 60,000 tons of basic to be made by a furnace which will take ore from the Republic company. The furnace company which is about to make this contract has withdrawn quotations on basic recently made. The basic market is firmer, although $13 valley, can still be done. One Cleveland company having furnaces outside of this district reports that the outlook is that it will sell more pig iron this month than it has sold during the past six months. The general situation is more favorable. We quote, delivered in Cleveland, as follows for the remainder of the year:

No. 1 foundry	$14.50
No. 2 foundry	14.25
No. 2 southern	14.35
Gray forge	13.25
Bessemer	15.90
Lake Superior charcoal	17.50
Jackson Co. 8 per cent silvery	18.00

Coke.—The market for both foundry and furnace grades is dull, the prices are unchanged. We quote:

Connellsville furnace coke, $1.40 to $1.50 for prompt delivery, and $1.60 to $1.80 for second half, Connellsville foundry coke, $1.80 to $2 for prompt, and $2.15 to $2.35 for second half.

Finished Material.—Reports of different companies vary somewhat as to business conditions, but on the whole the market seems to be little more than holding its own. Sheet manufacturers are eager to book orders and prices are shaded in some cases. Orders for bar iron are not coming in at a rate which promises resumption of the Union and Empire mills on Aug. 1. Bids on the steel for the city hall were received today.

Old Material.—Brisk inquiry for old material during the past few days has created a better feeling in the local scrap market with the result that dealers are holding stocks for better prices than those which have prevailed for some time. A Sharon concern is in the market for a large tonnage of heavy melting steel while a Canton buyer is ready to take a large lot at $11.75, f. o. b. Cleveland, but dealers are reluctant to do business at this figure. A Cleveland mill which recently closed for a considerable tonnage of heavy steel is again in the market while another local mill has a large inquiry out for No. 1 busheling and machine shop turnings. The Norfolk & Western and the Baltimore & Ohio railroads have disposed of large quantities of scrap for which they recently solicited bids. It is known that the prices offered were higher than those recently quoted for other lots. We quote prices per gross tons, f. o. b. Cleveland, as follows:

Old iron rails	$15.00 to 15.50
Old steel rails (under 6 ft.)	12.00 to 13.00
Old steel rails (over 6 ft.)	11.75 to 12.25
Relaying rails	19.00 to 20.00
Old car wheels	12.00 to 12.50
Old steel boiler plate	9.50 to 10.00
Malleable iron (railroad)	11.75 to 12.00
Steel axles	19.00 to 19.50
Axle turnings	9.00 to 9.50
Malleable iron (agricultural)	11.00 to 11.50
Heavy steel	11.50 to 12.00
Country mixed steel	9.00 to 9.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$12.00 to 12.50
No. 1 busheling	10.00 to 10.50
No. 1 machine cast	11.00 to 11.50
No. 1 dealers' wrought	10.50 to 11.00
Machine shop turnings	6.75 to 7.00
Pipes and flues	8.00 to 8.50
Wrought drillings	6.75 to 7.00
Stove plate	9.50 to 10.00

The Henderson fiscal court, of Henderson, Ky., has let a contract for the construction of two steel bridges to the Vincennes Bridge Co., of Vincennes, Ind.

CINCINNATI

Cast Iron Pipe Makers Buy Considerable Tonnage.

Office of THE IRON TRADE REVIEW,
808 Provident Bank Bldg., July 18.

Pig Iron.—Perhaps the most active industry engaged in the melting of pig iron is that of pipe making throughout the country, whose business is said to be always good when the price of iron is at low ebb. This appears to be the case at the present time, as reports indicate that considerable tonnage has been taken by these industries in a quiet way during the past month or two. The prevailing opinion with regard to the situation in the south seems to indicate that July reports will show a slight decline in stocks on yards due, however, more to curtailment in production than to any increase in demand. Market conditions generally show little change, but as compared with April, May and June, the present month is ahead in volume of business transacted. Quotations to all appearances are fairly well established and so far as can be ascertained are holding at $10 Birmingham for southern and $13 Ironton for northern. Some little inquiry has developed for ferro manganese, and low phosphorus grades, and there is a slightly better tone to charcoal demand.

What little movement is evident in foundry iron has been confined mostly to the lower grades, quiet sales and small lots prevailing. There is an inquiry pending from a large concern in Indiana for 1,500 tons of malleable, delivery covering the year. A wagon manufacturing company in northern Ohio is inquiring for 300 tons of northern and 300 tons of southern to cover requirements for remainder of the year. One of the large foundry interests is in the market for 1,000 tons of No. 3 and 1,000 tons of No. 4 for third quarter and a like amount for the fourth quarter of the year. Another southern Ohio melter requires 600 tons of various southern grades and 1,500 tons of northern iron for last half.

A sale of 500 tons of southern No. 2 is reported for third quarter delivery, and one of 400 tons for July to October delivery, in Indiana territory, at market quotations. A concern in southern Ohio bought 500 tons of sonthern No. 2, delivery running through the remainder of the year. One of the large rolling mill interests of the country is said to be interested in 1,800 and probably double this tonnage of malleable as well as some foundry grades. Scattering lots of Virginia irons have been sold throughout the week. We quote prices based on freight rate of $3.25 from Birmingham, and $1.20 from Ironton, as follows:

Southern foundry No. 2	$13.25
Southern foundry No. 3	12.75
Southern foundry No. 4	12.50
Southern gray forge	12.00
Mottled	12.25
Southern No. 1 soft	14.70
Southern No. 2 soft	14.20
Standard southern car wheel	25.50
Northern No. 2 foundry	14.20
Northern No. 3 foundry	13.70
Northern No. 4 foundry	13.20
Jackson county 8 per cent silicon	16.95

Coke.—The market is quiet and featureless. Some small contracts for furnace brands have been closed during the week, yet the aggregate tonnage has been small and of no particular moment. Prices are holding fairly well, and show little fluctuation. We quote from the leading coke districts as follows:

	Prompt shipment.	Contract second half.
Connellsville district:		
Foundry coke	$2.00 to 2.25	$2.00 to 2.40
Furnace coke	1.50 to 1.65	1.65 to 1.75
Wise county district:		
Foundry coke	2.00 to 2.25	2.00 to 2.25
Furnace coke	1.75 to 2.00	*Sliding [scale basis.
Pocahontas district:		
Foundry coke	2.00 to 2.15	2.00 to 2.35
Furnace coke	1.60 to 1.75	1.75 to 1.85
New river:		
Foundry coke	2.50 to 3.15	2.60 to 3.25
Furnace coke	2.10 to 2.15	2.10 to 2.20

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16 2-3 per cent of the amount over $9 at which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material.—Demand for finished material is reported as very good and satisfactory, and sales for the year thus far compare very favorably with the preceding one. Specifications are said to be good along the line of structural angles and plates, and steel bar products generally. Steel bars are quotable at 1.25c, Pittsburg, and structural angles and plates at 1.35c net, Pittsburg.

Old Material.—A small tonnage of railroad scrap has found its way into the market during the week, although trade generally has been light and sales of small importance. Dealers are fairly well stocked with materials of all kinds, and are waiting for prices to get better. We quote prices as per last report.

GROSS TONS.

Old iron rails, gross	$14.00 to 14.50
Old steel, rerolling, gross	13.00 to 14.00
Old iron axles, gross	19.25 to 19.75
Steel melting scrap, gross	11.00 to 11.75
Car wheels, gross	11.50 to 12.50

NET TONS.

Old No. 1 R. R. wrought	$12.25 to 12.75
No. 1 machinery	10.50 to 11.00
No. 1 busheling	9.25 to 9.75
Stove plate	7.75 to 8.25
Machine shop turnings	6.50 to 7.00
Cast borings	5.50 to 6.25
Grate bars	7.25 to 8.00
Sheet scrap, bundled	8.00 to 9.00
No. 1 cast scrap	10.00 to 11.00
Heavy turnings	7.75 to 8.75

PHILADELPHIA

Pig Iron Sales More Numerous—Finished Market Moving Slowly.

July 17.

The general movement of the market is only moderately better. Finished conditions among eastern producers with some exceptions are not displaying any marked increases of volume of business entered upon mill books. The prospects of the market are more favorable and some encouragement is felt. Pig iron still shows an irregular demand, but upon the whole is better. Scrap seems more tightly held in anticipation of some improvement.

Pig Iron.—A greater number and variety of small orders has featured the week. These have come from many different classes of consumers and apparently indicate the reduced melt of those buying as well as a disposition to engage their requirements in a hand to mouth manner. There is pending quite a number of inquiries of 500 tons and less, principally in foundry iron. Some good-sized blocks are also included in the week's sales. A drill manufacturer closed for 5,000 tons of No. 2 plain and No. 3 foundry for last half shipment at its New Jersey plant at a shade less than $14.50, delivered. The iron will be supplied by a near-by maker. A cast iron pipe maker in this territory took 3,000 tons of No. 3 southern at $9.50, Birmingham, for September shipment, supplementing a lot of northern off-basic reported last week. The leading pipe interest is sounding the market for a round lot of forge and lower grades. Virginia pipe makers have been buying a little iron, one of them closing for a part of a lot of 600 tons for prompt shipment at $12, Virginia furnace. A local malleable consumer closed for 1 200 tons of this grade for last half shipment at $13.50, western Pennsylvania furnace, or $15.95, delivered, in addition to 500 tons of charcoal iron. The price of $15, delivered, Philadelphia, for No. 2X foundry iron represents the practical minimum of the market, though this level has been slightly shaded on certain brands. To meet the $10, Birmingham, price for No. 2 southern, some makers in that territory are quoting this figure on an iron slightly below the straight No. 2

analysis. A sale of 500 tons of this nature to a Philadelphia consumer for forward shipment is noted. The Delaware, Lackawanna & Western railroad is inquiring for 1,500 tons of No. 1 and 2X for Scranton delivery. A current report in this market that one of the recent transactions made in basic established a new low level of $14.25, delivered, is yet lacking of complete substantiation. The sale in question is reported to have been made by a near-by furnace, but this is officially denied by the latter. One eastern buyer has been attempting for some time to break through the $14.50, delivered, price. If it has done so, which is not yet finally established, it is not likely to be able to duplicate the transaction, as makers are asking from $14.50 to $14.75, delivered, and the iron available at the former price is limited. The buyer in question is still in the market for forward iron. Low phosphorus iron sales are few and small, but the market is unchanged in this grade.

We quote for prompt and third quarter shipment, as follows:

No. 1X foundry	$15.25 to 15.50
No. 2X foundry	15.00 to 15.25
No. 2 plain	14.50 to 15.00
Standard gray forge	14.25
Basic	14.50 to 14.75
No. 2X Virginia	15.05 to 15.30
No. 2 southern	14.00 to 14.50
Standard low phosphorus	20.50 to 21.00

Finished Material.—Improvement in the market is still slow; in fact, general conditions with the principal eastern mills seem no more than holding their own. Some lines are considerably better than others. The demand for sheets is stronger and the mills of the principal maker in this territory, the Alan Wood Iron & Steel Co., are all in operation but the steel maker of the interest is only 50 per cent active. There is considerable movement in black sheets for enameling stock. Rails show no betterment. The Sparrows Point mills of the Maryland Steel Co. are running five days a week, but not at full capacity, and are active from 65 to 70 per cent. The Steelton mills, which give more attention to rail specialties, are operative at a less rate. The Bethlehem Steel Co. rail mill, the capacity of which is not so large, is well engaged. Eastern plate mills are just about keeping up their past gait.

The situation has some encouraging factors. Developments are expected shortly from the more active shipbuilding in prospect along the Atlantic coast. Some of this new construction is about ready to come before builders and the mills. Formal awards are expected this week on the four government colliers, bids for which were taken several weeks ago, showing the Maryland Steel Co. and the Newport News Shipbuilding & Dry Dock Co. to be low on two vessels each. Each boat will require about 5,500 tons of plates and shapes, 22,000 tons in all. The Central Iron & Steel Co. is expected to furnish the bulk of the plates for the two colliers to go to the Maryland Steel Co. The eastern railroads are more inclined to take up new purchases and to specify against old contracts, especially in spikes, bolts and other track material. One Philadelphia office entered orders for about 15,000 kegs of spikes during the past month.

Few additional awards have been made in structural material, but considerable tonnage is pending. The Ritz-Carlton hotel, this city, 1,000 tons, is being refigured and no final action on the fabrication of the West Philadelphia high school, for which Cramp & Co. have the general contract, has been taken, though it is expected it will go to the American Bridge Co. By the use of concrete, the steel requirements will be reduced to about 1,000 tons. Bids went in this week on the C. & O. office building, Richmond, 2,800 tons. The Industrial building, Baltimore, 1,100 tons, is held up. Bids for the 20-story office building of the American Trust & Savings Bank Co., Birmingham, Ala., have been postponed. The steel for the Phipps Institute, this city, about 700 tons, will be furnished by the American Bridge Co. under a contract placed some time ago. Some contracting in semi-finished steel continues and another eastern consumer has covered for 1,500 tons of forging billets for last half at full prices.

The market still hears occasional reports of price shading, chiefly in steel bars and plain shapes. The 1.20c, Pittsburg, steel bar price recently offered in this territory is now heard of only occasionally. Fabricating prices are still being sharply cut.

We quote, delivered in Philadelphia and vicinity, as follows:

Structural shapes, 1.50c; steel plates, 1.50c; steel bars, 1.40c; refined bar iron, 1.27c to 1.32c; cut nails, $1.75 to $1.80; blue annealed sheets, No. 10 gage, 1.65c; 4 x 4-inch open-hearth rolling billets, $24.40; forging billets, $28.40.

Old Material.—Dealers are finding more difficulty in obtaining the material to offer at the ruling quotations, as owners of scrap are holding to it more closely in anticipation of some betterment in prices. Some fair-sized lots of heavy melting steel have been taken from merchants by eastern consumers at $13.25, delivered, but the general market shows no great buying interest. The monthly railroad lists just closed brought about the prices which have lately prevailed in such transactions in which there is some competition between consumers buying direct and dealers speculating. Heavy steel in some of these lists went above $13.25, in some cases being reported as high as $13.50 delivered. The No. 1 railroad wrought in the case of one road sold at $15.65, delivered. The Pennsylvania railroad offered 20,000 tons, the Reading 3,000 to 4,000 tons, and other roads, about their customary amounts. We quote gross tons, delivered, in eastern Pennsylvania and New Jersey consuming territory as follows:

Old iron rails	$16.50 to 17.00
Old steel rails (rerolling)	13.75 to 14.25
No. 1 heavy melting steel	13.00 to 13.50
Old car wheels	13.00 to 13.50
Old steel car axles	18.00 to 19.00
Old iron car axles	24.00 to 25.00
No. 1 R. R. wrought	15.50 to 16.00
Wrought pipe	12.50 to 13.00
Cast borings	8.25t o 8.75
Wrought turnings	9.00 to 9.50
Heavy cast scrap	13.00 to 13.50
Railroad malleable	11.50 to 12.00
Stove plate	10.00 to 10.50

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa., and $1.20 to Harrisburg and Steelton, Pa.

Pig Iron Prices Firmer and Sales Have Decreased.

July 18.

Pig Iron.—The increased activity that marked the two weeks preceding has subsided somewhat in the last few days and there is a marked decrease both in tonnage placed and inquiry. The furnace interests give as one of the chief reasons for this a general firming of prices which has recently gone into effect. While the advance is not sufficient to warrant a change in price quotations, it is stated on good authority that absolutely no concessions are being made, and the furnace interests are more inclined to advance prices than to return to the low figures that have been quoted recently. The refusal to make price concessions has greatly reduced sales into the New England territory, where low prices quoted on Virginian iron have forced local furnaces to quote extremely low prices. Within the Buffalo district, in the neighborhood of 4,000 tons of iron have been booked, including one order of 1,000 tons of foundry iron for last half delivery, the balance

being mostly in small lots. Inquiry has been fairly good from within the district, amounting to upwards of 5,000 tons. The decrease in the business for the week has been partly attributed to the recent extremely hot weather which caused some of the large foundries throughout the state to shut down for several days. Aside from delays due to this cause, shipments have been going forward fairly well.

We quote f. o. b. furnace as follows:

No. 1X	$13.75
No. 2X	13.50
No. 2 plain	13.25
No. 3	13.25
Gray forge	13.00 to 13.25
Malleable	13.50 to 13.75
Basic	13.25 to 13.75
Charcoal	16.50 to 17.50

Finished Products. — Specifications have been coming in very well in all lines and prices remain firm. One agency estimates its business at about 70 per cent of its capacity. Structural lines continue active although there are no particularly large new jobs reported and few important lettings. Bars and plates are also showing an improvement.

Old Material.—The market shows no important changes. Business continues dull. The prices here quoted are largely nominal. We quote gross tons f. o. b. Buffalo as follows:

Heavy melting steel	$12.75 to 13.00
No. 1 railroad wrought scrap	14.75 to 15.25
No. 1 railroad and machine cast scrap	14.00 to 14.50
Old steel axles	18.50 to 19.00
Iron axles	23.00 to 24.00
Car wheels	13.75 to 14.25
Railroad malleable, scrap	13.75 to 14.00
Machine shop turnings	7.00 to 7.25
Cast iron borings	6.50 to 6.75
Low phosphorus steel scrap	17.00 to 17.50
Old iron rails	16.75 to 17.25
Tank iron	10.75 to 11.25
Sheet iron	6.50 to 7.00
Pipes and flues	10.75 to 11.25
Stove plate	12.00 to 12.50
Grate bars	11.50 to 12.00
Boiler plate	11.50 to 12.00

NEW YORK

Finished Conditions Irregular—Pig Iron Market is Quiet.

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg., July 18.

Iron Ore.—Some resale lots of old range non-Bessemer ore have been offered and sold to eastern consumers recently at considerably under the regular price schedule. A Schuylkill valley furnace has closed for a small block of this ore and some lake manganate ore, which together aggregate about 20,000 tons. Shipments against the long term contract for Swedish ore closed by the Bethlehem Steel Co. several weeks ago as reported, were begun the past week by the arrival of the steamer River Forth from Narvik, Norway, with a cargo of 6,000 tons consigned to the buyer. The steamer Knight Templar, with 10,000 tons, is now afloat. Some fresh chartering done this week shows an unchanged freight market from Mediterranean ports to Philadelphia. Two boats from Sagunto, Spain, to Philadelphia, were chartered at 9s 6d.

Pig Iron.—Apart from a purchase of a round tonnage of foundry iron by a large maker of pneumatic tools for New Jersey delivery, there are no transactions of note to be recorded in the metropolitan district this week. The market on the whole has been quiet. Sales have usually called for carloads or a few hundred tons and, although quite a good many negotiations of this kind have been closed, the tonnage involved is not impressive. One buyer in this territory closed for 1,000 tons of special analysis southern iron for early shipment on the basis of $10, Birmingham, for No. 2. High sulphur forge from the south has sold at $9, Birmingham, but the usual quotation for this grade is $9.25. There is continued evidence of a firmer condition in the Buffalo market and several makers, which recently advanced prices, seem to be holding faithfully to about $13.50, furnace, for No. 2X. Buyers, however, still report they are able to obtain iron from other Buffalo interests at $13.25, furnace, for No. 2X. Some eastern Pennsylvania interests which have been recently keenly following business at low prices, appear less aggressive for orders at the old levels, reflecting the large tonnages which some of these producers have booked in basic and foundry grades. We quote for prompt and third quarter shipment as follows:

Northern foundry No. 1	$15.00 to 15.50
No. 2X foundry	14.75 to 15.25
No. 2 plain	14.50 to 14.75
No. 2 Virginia	15.05 to 15.30
No. 2 southern foundry	14.00 to 14.50
Malleable	15.00 to 15.25
Gray forge	14.25 to 14.50

Ferro-Alloys.—Reports are coming from different directions of ferro-manganese having been sold recently at $36, seaboard. Some of these reported transactions are in the Pittsburg district. Sales are noted, however, of about 500 tons in carloads and small lots for forward shipment at $36.50, Baltimore. There is a better inquiry for ferro-manganese, but the quantities asked for are small. The other alloys are quiet. We quote 80 per cent ferro-manganese at from $52 to $52.50, Pittsburg.

Cast Iron Pipe.—No new public lettings of interest have come out this week, but the market continues fairly active. Prices show no improvement. Contractors entered bids this week on work for the Borough of Queens requiring 1,250 tons of pipe. We quote 6-inch pipe at from $21 to $21.50, f. o. b. New York.

Finished Material.—Conditions in the finished steel market show a lack of uniformity. A continued favorable activity in some lines is to be noted, but the general market is expanding very slowly. The leading interest continues to do better in its bookings than the independents, as a rule.

The continued active interest in structural material and the promising outlook in this branch of the market represent a favorable feature of the situation. It is estimated on good authority that fabricated awards during the first half were between 600,000 and 700,000 tons, which compares quite well with other recent corresponding periods. The outlook for the second half of the year indicates that this tonnage is likely to be exceeded, as there is some unusually large work in prospect, including in the New York territory alone the subway and elevated extensions, the Hell Gate bridge, and a large variety of building work. Low fabricating prices, especially in bridge work, are still disturbing what otherwise might be a fairly satisfactory condition of trade.

Awards of the past week have been less numerous and action on pending contracts seems less prompt. The Pennsylvania Bridge Co. has taken 1,100 tons for a bridge for the New York, Ontario & Western Railroad, at Hancock, N. Y., and 200 tons for a bascule bridge for the Boston Elevated Railroad of Boston. The American Bridge Co. has 1,200 tons for the Wilson building, Broadway and Thirty-third street, this city. The Jones & Laughlin Steel Co. has taken 400 tons for the Poli theatre, New Haven, Conn., and 150 tons for the Pennsylvania Railroad station at Newark, N. J. Action is still awaited on 4,000 tons for the Old Dominion Steamship piers at Norfolk, Va.; on 1,000 tons for the Bingham Memorial hospital, Boston; on 1,000 tons of bridge work for the Chesapeake & Ohio railroad, and 500 tons for the *Post-Despatch* building, Richmond, Va. The bids for the Albany high school, 1,200 tons, have been rejected.

The American Bridge Co. has taken about 500 tons for the Eastman Kodak Co., Rochester, N. Y., and the Groton Bridge Co. about 200 tons for Rand hall, Cornell university, at Ith-

aca. The general contract for the office building of the General Electric Co., Erie, 800 tons, has gone to John Gill & Sons, Cleveland, and the steel will probably be fabricated by the Buffalo Structural Steel Co. The Jacob Rupert Brewery, this city, has up a brew house, about 1,500 tons, upon which Bethlehem sections are specified. The Geo. A. Just Co. has the general contract for this work. Action is still pending on the large Hell Gate bridge contract, for which bids were entered some time ago. We quote, delivered at New York tidewater, as follows:

Angles, 3 to 6 inches and heavier, 1.51c; tees, 3 x ¼ inch and heavier, 1.51c; plates, carload, tank, 1.51c; boiler steel, 1.61c; marine boiler, 1.91c; bar iron, 1.30c to 1.35c; soft steel bars, 1.41c.

Old Material.—The market, if anything, is quieter, and metropolitan dealers report only a moderate amount of buying in the week, which has been chiefly in small lots. New contracts from consumers are small, but there is a fair amount of shipping against old contracts. Prices are about stationary. A sale of 300 tons of wrought pipe at $12.50, delivered, in eastern Pennsylvania, is noted. Steel scrap is moving in small lots. We quote, gross tons, prices New York dealers will pay at tidewater, with the exception of cast scrap, which has a local demand, as follows:

Old car wheels	$11.25 to 11.50
Old iron axles	17.50 to 18.00
Old steel shafting	14.00 to 14.50
No. 1 heavy melting steel	11.00 to 11.25
No. 1 R. R. wrought	12.00 to 12.50
Iron track scrap	11.00 to 11.50
Wrought pipe	9.75 to 10.25
Cast borings	5.75 to 6.00
Wrought turnings	6.00 to 6.50
Heavy cast scrap	11.50 to 12.00
Railroad, malleable	10.00 to 10.50
Stove plate	8.75 to 9.00
Grate bars	9.00 to 9.50

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City and $1.60 from New York, and to Roebling N. J., $1.00 from Jersey City and $1.50 from New York.

Pipe Line Inquiry.—The Interstate Commerce Commission, preliminary to a systematic investigation of the rates and classifications of all pipe lines, has made each a defendent in cases initiated by the commission, as a result of informal complaints which have reached it. In all, there are 62 pipe line corporations affected by the suit. It is claimed that their rates and regulations are discriminatory and unfair, and that the pipe lines are being conducted and operated to the prejudice of shippers and not in accordance with law.

BIRMINGHAM

Some of the Aggressive Sellers Are Not So Active.

Birmingham, July 17.

Pig Iron.—The past week witnessed the booking of considerable tonnages of Alabama iron. It also developed the fact that with some of the most aggressive sellers there has developed a shortage of certain grades, and in fact on some grades these makers are now entirely out of the market. While there is no change in the schedule of prevailing prices, it would not be at all surprising to see a withdrawal from the market altogether on the part of some interests. Today the tendency is to shorten the time of delivery on all offerings. There are several good sized inquiries on the market for the lower grades like forge and No. 4 foundry for pipe making. There is also some fair inquiry, with actual shipments, of the higher grades to the Pacific coast terminals. Prices for prompt shipment or for third quarter 1911 delivery remain as follows per gross ton, f. o. b. cars Birmingham district furnaces:

No. 1 foundry and soft	$10.50 to 10.75
No. 2 foundry and soft	10.00 to 10.25
No. 3 foundry	9.50 to 9.75
No. 4 foundry	9.25 to 9.50
Gray forge	9.00 to 9.25
Basic, chill cast	10.25 to 10.50

Cast Iron Pipe.—Some improvement has developed in the inquiry for cast iron water pipe, with a steady placing of small orders. Shipments continue good. Prices remain firm. Thus far there has been no change in the rate of production of water pipe in the Alabama district. The sale of one of the largest plants here has been reported as completed, and it is stated on apparently good ground that this plant will be taken over by the largest producer of water and gas pipe; but whether the plant will be operated at an early date is not known. In fact, no official announcement as to plans has been made here in connection with the reported transfer. Prices are still quoted as follows, per net ton, f. o. b. cars factories, Birmingham, Bessemer and Anniston: 4-inch to 6-inch, $22; 8-inch to $12-inch, $21; over 12 inches, average, $20, with $1 per ton extra for gas pipe.

Old Material.—With the evident intention of the railroads to begin covering their requirements in the way of finished iron and steel products, there is more interest being manifested in the scrap iron market, as this movement means the placing on the markets in one way or another, more or less of the accumulation of scrap on railroad yards. Still, the Birmingham scrap market is in far from a satisfactory shape from the standpoint of the dealer. Very little actual business is being consummated, and for another 60 days it is not expected the volume of business will be very large. Quotations by dealers remain nominally as follows, per gross ton, f. o. b. yards here:

Iron axles	$15.00 to 16.00
Iron rails	13.00 to 13.50
Steel axles	14.00 to 14.50
No. 1 R. R. wrought	12.00 to 12.50
No. 2 R. R. wrought	11.00 to 12.00
No. 1 country scrap	8.50 to 9.00
No. 2 country scrap	7.50 to 8.00
No. 1 machinery	10.00 to 11.00
No. 1 steel	9.50 to 10.00
Old standard car wheels	11.00 to 11.50
Light cast and stove plate	8.00 to 8.50

ST. LOUIS

Contract for New Sky Scraper Will Soon be Awarded.

July 17.

Pig Iron.—The market for pig iron in the St. Louis territory is a little more encouraging than it has been for some time. While there are no inquiries of consequence out, prices are somewhat stronger, talk of $10 iron having about subsided, and sales were reported last week totalling about 1,000 tons of southern grades. Buyers are holding off, but local agents seem confident that signs for business are better. Northern iron is in very little demand, with prices unchanged from last week. Our tabulated prices on southern iron, delivered, to which the Birmingham freight of $3.75 has been added, follow:

Southern No. 1	$14.25 to 14.75
Southern No. 2	13.75 to 14.25
Southern No. 3	13.50 to 14.00
Southern No. 4	13.25 to 13.75

Coke.—Buying in coke is virtually at a standstill, but there is some talk of better prices. Our quotations follow:

We quote 72-hour Connellsville foundry grades, $1.90 to $2.40 for whole of 1911; 72-hour foundry, $1.90 to $2.15 on tracks and for immediate delivery; 48-hour Connellsville furnace, $1.40 to $1.50; best 72-hour Virginia foundry, $2 to $2.25; 48-hour Virginia furnace, $1.60 to $1.85. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Finished Material.—The prospect for business in structural material has been encouraged with the announcement that work of wrecking the Barr's building for a 22-story modern business and office structure, to cost between $4,000,000 and $6,000,000, will

be started soon. Five hundred workmen are ready to begin demolishing the old building on the site, bounded by Olive, Sixth and Seventh street and Locust street, embracing an entire city block. The contract calls for the completion of the new building within 15 months. The contract for the structural steel for the new building may be let within the next two weeks. Mauran & Russell of St. Louis, are the architects. Structural material has been in fairly good demand the last two weeks, and specifications have called for quick shipments. One contract for five and a half miles of standard rails was let for a Kansas City firm last week, and several inquiries for small lots are out that will be placed within the next 10 days. Track fastenings are in poor demand. There is some inquiry for light rails, but buyers seem disposed to hold off before placing orders. Few orders have been received for steel bars, due principally to the low cost of iron.

Old Material.—Transactions in scrap iron have shown no improvement within the last week, and there is no indication of immediate business. Our quotations follow:

Old car wheels	$12.50 to 13.00
Old iron rails	13.50 to 14.00
Rerolling rails (4 ft. and over)	12.00 to 12.50
Old steel rails (2 ft. and under)	11.00 to 11.50
Light section relayers, 45 lb. and under, subject to inspection	19.50 to 22.00
Relaying rails, subject to inspection	24.00 to 24.50
Frogs, switches and guards	11.50 to 12.00
Heavy melting steel	11.50 to 12.00
Shoveling steel	11.00 to 11.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$11.00 to 11.25
No. 2 R. R. wrought	10.00 to 10.25
Arch bars and transoms	13.25 to 13.50
Knuckles, couplers and springs	12.00 to 12.50
Shafting	14.25 to 14.50
Iron car axles	18.00 to 18.50
Steel car axles	17.00 to 17.50
Locomotive tires	14.00 to 14.50
No. 1 country wrought	9.50 to 10.00
Pipes and flues	8.00 to 8.50
No. 1 busheling	9.25 to 9.50
No. 2 busheling	6.00 to 6.50
Cast and mixed borings	5.00 to 5.50
Machine shop turnings	6.50 to 7.00
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Stove plate	9.00 to 9.50
Angle splice bars, iron	11.75 to 12.25
Angle splice bars, steel	11.00 to 11.50

British Iron Markets

Slight Rally Follows Period of Dullness.—Prices Advance.

Office of THE IRON TRADE REVIEW, Prince's Chambers, Corporation St., Birmingham, Eng., July 8.

There has been some rally in the iron markets this week, following a period of suspense and dullness occasioned by holidays and the coronation. In the Middlesbrough district, a brighter tone prevails, and there is some improvement in price. A more satisfactory influence is being exerted by the sanguine view of the future, which traders are now inclined to indulge. Stocks continue to show a decline, a reduction of 1,895 tons taking place on Thursday. This represents a decrease on the month of 789 tons. Conditions here are assisted by the continuance of favorable reports from over the water. Cleveland quotations are 46s 9d ($11.44), prompt delivery, of No. 3. G. M. B. iron. Warrants have increased by two-pence, bringing the price up to 46s 7d ($11.40), the highest figure realized since May 24. Consumers show greater disposition to buy. Surprise has been caused by the announcement of the average selling price for last quarter as 49s ($12), a figure very much above the quoted prices of the month. The local iron meeting on Thursday revealed a fair amount of activity in this district, though conditions were quieted by the proximity of the quarterly meeting fixed for next week, and renewals and new contracts, largely speaking, have been deferred to this meeting.

Pig iron was notably firm and a fair amount of business was transacted, but makers show strong disinclination to commit themselves to forward bookings, having little faith in current quotations. The whole feeling of the market appeared to be that better prices would be obtainable in the near future, and this prospect exerted its influence. Makers of East Coast hematite report some improvement in demand for mixed numbers selling at 61s 6d ($15.06), for early delivery. Rubio ore remains at 19s to 20s, delivered, at Middlesbrough. Consumers still refrain from buying and imports are much below the average for this period.

Finished Department.—Steady improvement continues in finished iron and steel. The works are very fully occupied for a long time to come and prospects are in every way encouraging. Foundries and engineering establishments are doing much better. In the Manchester district only is a discordant note sounded. There, the stoppage of a number of works has resulted in dullness, but the tone is improving in consequence of a rise in warrant prices. Sellers of foreign steel did not put in an appearance at the weekly meeting, so that it was impossible to judge whether there was any change in the prices of semi-steel. Work in the steel trade in the Sheffield district is somewhat irregular, though it is being resumed generally after stock-taking.

The Norwalk Drilling Tool Co., Norwalk, O., has increased its capital stock from $10,000 to $20,000.

METAL MARKETS

St. Louis

July 17.

Lean and Zinc.—Choice grades of zinc blende brought a top price of $44 a ton in the Missouri-Kansas-Oklahoma district last week, on an assay base of $42 a ton for 60 per cent qualities. For car load lots, the base price ranged down to $38 a ton. Figured on a basis of $5.57 for spelter as an average price at East St. Louis, the price for blende was $41.84 a ton. This was $1 higher than the previous week.

The price for calamine was fairly strong at $21 to $23 a ton on an assay base of 40 per cent metallic contents. Choice lots of calamine brought $30 a ton.

Lead ore was weaker at $56 to $58 a ton, choice lots bringing a little higher figure.

New York

July 18,

Tin.—Freer offering of tin in London for both prompt and future delivery (the latter extending into October), yesterday and today, caused declines of £3 15s in spot and £3 5s in three months. It has been surmised that the selling was done for the syndicated interests. The decline came as a surprise to the local trade, inasmuch as a better demand, though still light, has prevailed for the metal in this market recently. The heavy arrivals since July 1 have entirely relieved the scarcity of the metal for prompt delivery, here, and local prices are down to the London parity again. The inquiries from domestic consumers have been confined to 5 and 10-ton lots, and resultant sales during the past few days aggregate only a moderate total. Spot tin can be bought today at 42.25c, July at 42c, and August at 41.75c.

The London market closed weak; spot at £193 and three months at £185 15s. Tin arrivals since July 1, aggregate 2,324 tons, and there are 3,260 tons afloat.

Copper.—The copper metal market has been unusually quiet the past week, but prices have been well maintained. Some sellers have offered electrolytic at 12.62½c, delivered 30 days, but the leading interests continue to ask 12.75c for that brand, and 12.87½c for lake on the same terms of payment.

The European statistics of copper for the first half of July were cabled to this market yesterday, and showed that consumption of the metal abroad continues good. Foreign stocks decreased 1,280 tons, and afloats decreased

950 tons. The total of stocks included in the statistics is now 67,940 tons.

Notwithstanding the favorable report, London quotations on standard copper have declined during the week. Spot closed today at £56 13s 9d and three months at £57 5s.

Exports of copper since July 1 are 13,952 tons.

Lead.—It is reported in this market that 4.40c is bid for pig lead in St. Louis, and that sellers are scarce at under 4.42½c. The New York market has advanced accordingly, and outside of the American Smelting & Refining Co., which continues to quote 4.50c in New York, it is hard to find a seller under 4.57½c.

Spelter.—The demand for spelter has weakened and prices are less firm than last week. The general quotation for prompt shipments is 5.75c in New York, but it is probable that sellers could be found willing to shade that price.

Antimony.—The antimony market is weak. Cookson's is 8.50c, Hallett's is 8c, and Hungarian is 7.25c.

Chicago.

July 18.

New Metals.—The copper situation improved somewhat last week, largely due to advices received from the east that the monthly report of the Copper Producers' Association showed a decrease of 8,000,000 pounds in the stock of refined metal on hand July 1, due to increased exports. Spelter declined $1 a ton during the week and trading has been light. Lead is somewhat higher and minimum quotations are now 4.45c, Chicago, in 50-ton lots.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Lake copper, carload lots, 13c; casting, 12¾c; smaller lots, ¼c to ⅜c higher. Spelter, car lots, 5.60c; lead, desilverized, 4.45c in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, $7.50 list, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 44c; Cookson's antimony, 10c; other grades, 9c to 10c.

Old Metals. — There was a fair amount of business transacted during the past week, particularly in brass and copper.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Copper wire, 12½c; heavy copper, 12c; light copper, 10½c; heavy red brass, 10½c; heavy yellow brass, 9¼c; light brass, 7c; No. 1 red brass borings, 9½c; No. 1 yellow brass borings, 7½c; brass clippings, 8½c; tea lead, 3.80c; lead scrap, 4½c; zinc, 4½c; tin pipe, 39½c; tin foil, 38c; pewter, 27c; electrotype plates, free from wood, 4c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3¼c; linotype dross, 3¼c; prime slab zinc dross, $70 per ton.

UNION COMPANY

Purchases Patents From the General Electric Co.

Pittsburg, July 17. (By wire.)

The Union Switch & Signal Co., Swissvale, Pa., has purchased from the General Electric Co., Schenectady, N. Y., all of its patents relating to railway signaling, together with its stock and manufacturing equipment of this line of work. The Union company is now prepared to furnish the signaling apparatus heretofore supplied by the General Electric Co. While this sale does not include accessory apparatus, such as switchboards, rectifiers, motor generator sets, generators, etc., the Union Switch & Signal Co. will now be able to offer General Electric accessory appliances to effectively supplement its line of signal material when making complete signal installations.

NEXT MONTH

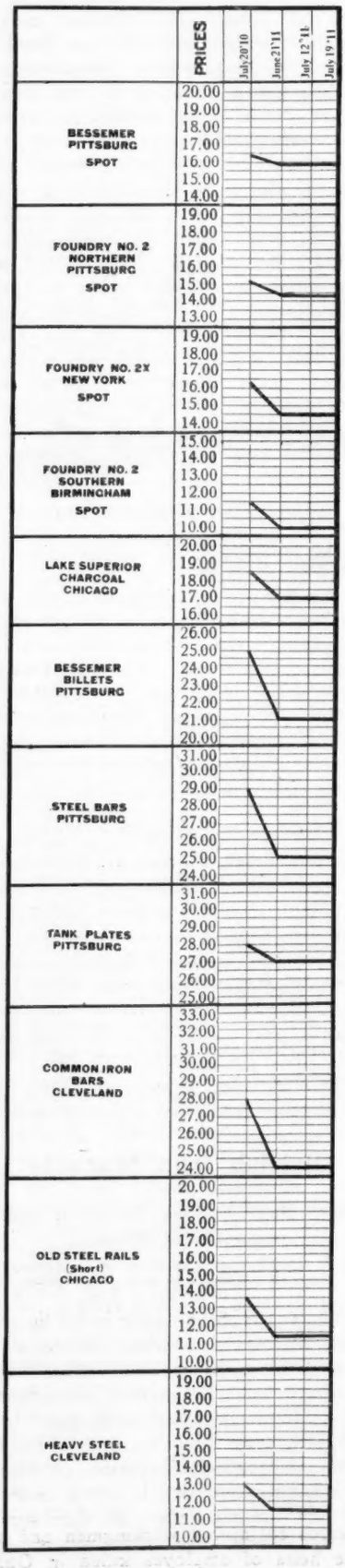
Improvement is Expected to Come in Lake Trade.

No improvement is to be noted in the ore trade, shippers having difficulty in keeping their own vessels employed. Wild carriers are coming down light and some vessels belonging to shippers are occasionally doing the same thing. No change is expected during July, but if furnaces are going to take ore at all, they will have to order in August or run chances of going without. Improvement is confidently looked forward to in August and a leading shipping interest, which has not as yet put all its vessels into commission expects to do so next month. A demand still exists for small boats in the coal trade though large steamers have to wait for cargoes.

VISIBLE COPPER SUPPLY

The fortnightly statistics of European copper show that the supply of copper in Europe on July 15 showed a decrease of 1,625 tons, while the supply afloat increased 150 tons, making a net decrease in the visible supply of 1,475 tons.

PRICE CHART



LARGE BLOCK OF BASIC

Taken by Republic Iron & Steel Co. in Exchange for Ore.

Pittsburg, July 19. (By wire.)

The Republic Iron & Steel Co., which recently completed its new open-hearth steel works in the Youngstown district, has purchased a block of 60,000 tons of basic pig iron from the Struthers Furnace Co. for delivery over the remainder of this year and the first four months of 1912, giving iron ore in exchange. This is the largest transaction in pig iron negotiated in this market for more than two years and is important in view of the fact that heretofore the Republic Iron & Steel Co. has not been a general buyer of basic. Details of the price paid for the iron and the amount of ore involved, etc., are withheld, but it is understood that the price paid for the basic is about the same as quoted by other furnace interests for forward iron. Other fairly large lots of basic and foundry pig iron have been sold since July 1. There is somewhat of a mystery surrounding these sales. The market is unsettled, although slightly firmer than 10 days ago. Basic developments show that one lot of basic was sold a few days ago at $13, valley for July shipment.

Tennessee Retires From the Market

Cincinnati, July 19. (By wire.)

The Tennessee Coal, Iron & R. R. Co. has advanced the price of pig iron to $11 Birmingham, presumably due to the fact that its current output has been disposed of for the remainder of the year. General market conditions, however, remain unchanged and prevailing quotations still hold good. Several inquiries that have been pending for the past week or two are still open and melters have not bought to date.

Ohio Board of Awards

W. A. Grieves, of Columbus, O., who at present is in charge of the employment department of the Jeffrey Mfg. Co., of that city, has been appointed by Governor Harmon, of Ohio, as one of a committee of three that will form the Ohio board of awards under the new employers' liability law. The duty of the board will be to grant awards to injured workingmen and to the heirs of employes killed in Ohio industries. The other members of the board are Thomas J. Duffy, East Liverpool, O., and Wallace D. Yaple, Chillicothe, O. Mr. Grieves has handled the work of the benefit association, which is maintained jointly by the Jeffrey Mfg. Co. with its employes, and formerly had charge of the Columbus Y. M. C. A.'s employment department. He read a paper at the April meeting of the National Metal Trades Association in New York.

Bids on Cleveland City Hall

The commission in charge of the construction of the proposed new city hall, Cleveland, opened bids for the structural steel, July 18. The prices quoted on the steel delivered were: Republic Structural Iron Works, $178,500 or $42 per ton, to be completed in 75 days; T. H. Brooks & Co., $169,362.50 or $39.85 per ton, to be completed in seven months; American Bridge Co., $174,250 or $41 per ton, to be completed in six months; McClintic-Marshall Construction Co., $185,300 or $43.60 per ton, to be completed in 180 days; Riverside Bridge Co., $186,787.50 or $43.95 per ton, to be completed in nine months; Forest City Construction Co., $195,500 or $46 per ton. The bidders offer to deduct 60, 40, 60, 80, 65 and 75 cents per ton respectively if allowed to omit the coating of shop paint. The above bids do not include erection. It is reported by the city law department that the Republic Structural Iron Works bid is informal, it having been based on a theoretical weight. As the bids exceed the amount of money in the hands of the commission, it is possible that only a portion of the contract will be awarded at present.

Harvester Launched

The bulk freighter Harvester, the third vessel to be built on the great lakes of Isherwood construction, was launched from the Lorain yard of the American Ship Building Co., for the Wisconsin Steel Co., the lake end of the International Harvester Co., on Saturday, July 15. The Harvester is 545 feet over all, 525 feet keel, 58 feet beam and 31 feet deep. F. R. Gadd, vice president of the Wisconsin Steel Co., witnessed the launching. The Harvester will be ready to go into commission in about a month.

The citizens of San Mateo, Cal., are considering the installation of a municipal waterworks system.

SHARP SHADING

On Steel Bar Prices.—Below 1.20c Has Been Done.

New York, July 19. (By wire.)

Sharp competition in certain lines of finished products is reflected by shading in prices, especially steel bars on which the 1.20c price seems more common, as some makers are now meeting competition of those producers aggressive for business at this level. In some cases, 1.20c has been shaded. Close prices are being made on rivets, as low as 1.50c Pittsburg having been quoted. There is some shading on plates in the eastern district reported, but shapes seem firm.

The Illinois Steel Co. reports 45,000 tons of rails, largely orders previously reported. New business includes 11,000 tons to the Illinois Central. The Carnegie Steel Co. has 3,200 tons, including 2,500 tons for export. The Tennessee company has 2,400 tons scattering.

New Equipment for Intercolonial Railway

Ottawa, July 17.

Contracts have been awarded by the railway department amounting to $500,000 for new equipment for the Intercolonial Railway. The Canadian Locomotive Works has obtained a contract for five locomotives costing $114,000; the Canadian Car Co. for 230 steel framed box cars, 20 steel platform cars, 25 dump cars, 2 baggage cars and a refrigerator car, totalling $334,790; and the Nova Scotia Car Co. 100 freight cars, two postal and two stock cars for $112,000. It is understood that Dominion Steel Co. has put in the lowest tender for steel rails.

Contesting for Dividends.—George Westinghouse, former president of the company, in conjunction with Chas. J. Canda, of 5 Nassau street, New York City, is collecting proxies from stockholders for the annual meeting of the Westinghouse Electric & Mfg. Co. to be held in Pittsburg, July 26, when four directors will be elected. Mr. Westinghouse is opposing the present management in its decision to allow no dividends on the assenting stock and is hoping to elect directors at the meeting favorable to his policy. Mr. Canda has sent out a circular letter to the holders of the assenting stock, asking for their proxies for Mr. Westinghouse and himself. The author of the letter is a large holder of the assenting stock.

HEAVY DECLINES

Shown In Lackawanna Steel Co.'s Income and Surplus.

Heavy decreases in earnings and surplus and in the unfilled orders upon the books at the close are shown by the second quarter operations of the Lackawanna Steel Co., ending June 30, the report of which has just been issued. The surplus for the second quarter is but $71,843, a decrease of $1,036,192 from the corresponding quarter of 1910, while the falling off in income is $1,194,480. The combined first half report of the company is equally unfavorable.

The reports with comparisons are as follows:

Lackawanna Steel Company and Subsidiary Companies.

COMPARATIVE STATEMENT OF INCOME ACCOUNT.
Second Quarter.

	1911.	1910.	Decrease.
Income from manufacturing and operating after deducting all expenses incident thereto, including ordinary repairs and maintenance of plants and interest on bonds and fixed charges of subsidiary companies	$ 651,661.77	$1,662,002.04	$1,010,340.27
Proportion of earnings on investments in companies not controlled, and of other annual income	164,859.59	349,000.00	184,140.41
Total	$ 816,521.36	$2,011,002.04	$1,194,480.68
Deduct interest on Lackawanna Steel Co. bonds, debentures outstanding	437,500.00	437,500.00	
Balance	$ 379,021.36	$1,573,502.04	$1,194,480.68
Less charges and appropriations for the following purposes:			
Sinking funds on bonds and exhaustion of minerals	59,781.50	101,402.30	41,620.80
Depreciation and accruing renewals	247,396.22	364,063.35	116,667.13
Total deductions	$ 307,177.72	$ 465,465.65	$ 158,287.93
Surplus for second quarter	$ 71,843.64	$1,108,036.39	$1,036,192.75
Unfilled orders (gross tons)	218,391	379,836	161,145

COMPARATIVE STATEMENT OF INCOME ACCOUNT.
First Half.

	1911.	1910.	Decrease.
Income from manufacturing and operating after deducting all expenses incident thereto, including ordinary repairs and maintenance of plants and interest on bonds and fixed charges of subsidiary companies	$1,271,735.41	$2,749,093.38	$1,477,357.97
Proportion of earnings on investments in companies not controlled, and of other annual income	334,625.57	678,000.00	343,374.43
Total	$1,606,360.98	$3,427,093.38	$1,820,732.40
Deduct interest on Lackawanna Steel Co. bonds and debentures outstanding	875,000.00	833,333.34	*41,666.66
Balance	$ 731,360.98	$2,593,760.04	$1,862,399.06
Less charges and appropriations for the following purposes:			
Sinking funds on bonds and exhaustion of minerals	114.191.69	191,614.27	77,422.58
Depreciation and accruing renewals	509,595.94	708,165.92	198,569.98
Total deductions	$ 623,787.63	$ 899,780.19	$ 275,992.56
Surplus for first half	$ 107,573.35	$1,693,979.85	$1,586,406.50

*Increase.

Official Changes of Alan Wood Iron & Steel Co.

Several important changes among the executive officers of the Alan Wood Iron & Steel Co., Philadelphia, have been necessitated by reason of the recent death of Howard Wood, president of the company. Richard G. Wood, former vice president and nephew of the late president, has been made president; Jonathan R. Jones, former secretary and treasurer, has become vice president and treasurer, and W. W. Lukens, who has been assistant treasurer, has been made secretary in addition to his other duties. Mr. Wood, the new president, is the son of W. Dewees Wood, who built and operated a sheet plant at McKeesport, Pa., under the title of the Dewees Wood Co. This plant was subsequently absorbed by the American Sheet & Tin Plate Co., and is now known as the Dewees Wood plant of that interest. Mr. Wood engaged with his father in the manufacture of sheets in 1870 at McKeesport, and remained there until 1901. In 1904 he became vice president and director of the Alan Wood Iron & Steel Co., and later general manager of the steel works of the company. Mr. Wood was born near Wilmington, Del.

Mr. Jones, who is well known in the steel trade, has been connected with the Alan Wood Iron & Steel Co. since 1886, when he became identified with the company in the capacity of treasurer, a position which he has held up to the present time. Prior to that time, he was engaged in different connections as an engineer, in bridge construction, etc. Between 1866 and 1878, he was active at different times in the bridge engineering department of the Pennsylvania railroad, with the Pennsylvania Steel Co. during the construction of the Steelton, Pa., plant, and later with the Keystone Bridge Co., of Pittsburg. Between 1878 and 1886, he followed private practice as an engineer for the construction of bridges and buildings. Mr. Jones is a native of Conshohocken, Pa.

NEW MERGER

Takes in Companies at San Francisco. Portland and Seattle.

San Francisco, July 18. (By wire.)

An important merger was effected here yesterday whereby the Pacific Coast Steel Co., San Francisco, the Pacific Iron Rolling Mills, Portland, and the Seattle Steel Co., Seattle, become one corporation known as the Pacific Coast Steel Co., capitalized at $2,000,000. The corporation will manufacture light steel bars at Portland and Seattle. The main plant is to be in San Francisco. M. F. Wilson, Seattle, president; D. E. McLaughlin, Seattle, vice president; W. S. Burt, Seattle, secretary; D. P. Doak and W. T. Smith, San Francisco, and William Bigott, F. M. Wilson and D. F. McLaughlin, Seattle, directors.

Stanley Committee Will Resume

Washington, July 17.

The Stanley select committee of the house of representatives, for investigation of the Steel Corporation, decided in executive session today to resume its hearings on Thursday, July 20, when it will have as star witness Herbert Knox Smith, the commissioner of corporations.

The witness is the nominal author of the departmental report recently laid before the president, anent the United States Steel Corporation.

On July 26, the committee will go to New York and examine other witnesses there.

The plants of the Southern Iron & Steel Co., Gadsden, Ala., which were closed down on June 29, will continue inactive until Aug. 1. In the meantime, a force has been put to work making repairs and installing new machinery. According to a statement by an official of the company, the improvements are being made in anticipation of the prospective merger with the Alabama Consolidated Coal & Iron Co. The company's blast furnace at Alabama City continues in operation.

PANAMA GATES

Built by McClintic-Marshall Construction Co. Inspected.

More than 300 members of the Engineers' Society of Western Pennsylvania on Saturday, July 15, visited the shops of the McClintic-Marshall Construction Co. at Rankin, Pa., to inspect the lock gates for the Panama canal, which are under construction at that plant. Several sections of the gates had been assembled complete in the yards for the purpose. A special train carrying the guests left the Pittsburg & Lake Erie station, Pittsburg, at 12:50 p. m. and on the return trip left Rankin at 4:30 p. m. Luncheon was served in the company's dining room at the plant. An attractive hand-book, describing the Isthmian canal lock gates, was distributed.

Forty-six pairs or 92 leaves of lock gates are to be used in the three locks of the canal and the contract calls for 58,000 tons of structural steel work and steel castings. The length of each of these leaves is 64,912 feet center to center of bearings and their heights vary from 47 feet four inches to 82 feet, each leaf will consist essentially of a system of horizontal girders, vertical end girders, frames, diaphragms and intercostals, forming its skeleton and of steel plate sheeting extending from the top to the bottom on both sides of the leaf. Continuous nickel steel bearing plates secured to steel castings will be fastened to the ends of the leaf for its entire height to transfer the thrust due to water pressure to the lock wall and to the other leaf of the gate. A greenheart timber sill piece will be bolted to the bottom of each leaf. Above the top girder there will be a concrete foot-walk with movable hand-railings. The lower portion of the leaf will form an air chamber, sub-divided by vertical frames into smaller air-tight compartments.

Each leaf will be supported and hinged at the land end. At the bottom, a cast vanadium steel shoe with a bronze bushing will be fastened to the leaf and turn on a forged nickel steel pintle held in a steel casting, which rests on the foundation casting. At the top, the leaf will be secured to the lock wall by a nickel steel pin revolving in a bronze bushing in a cast vanadium-steel yoke, which forms part of the anchorage. The leaf will be swung by means of a stiff strut fastened to it at the top and operated by an electric-driven engine located in the lock wall and drawn into proper position and held tightly there by a mitering device at the miter ends.

The up-stream side of the leaf will have all exposed edges of sheathing, cover and splice plates caulked and made water-tight from the bottom of the leaf to the top of the air chamber. There will be six openings immediately above the top of the air chamber for the free flow of water into and out of the water chamber. The down-stream side of the leaf will have all exposed edges of sheathing cover and splice plates caulked and made water-tight over the entire surface. In the bottom panel, there will be four manholes with water-tight covers. The vertical ends of the leaf will be constructed of a flat plate and two bent plates connecting the former to the sheathing. The end reaction castings are carbon steel, and will be bolted to the ends of the leaf after proper adjustment by means of steel wedges, and will have nickel steel bearing plates fitted and bolted in recesses therein. The adjustment of the bearing plates will be carefully made and the space between the castings and the bearing plates filled with babbitt metal.

A steel man-shaft will extend from the top of the air chamber to the top of the leaf and will have a manhole at the top. In each leaf there will be five transverse vertical frames built in between the horizontal girders and extending from the bottom to the top of the leaf, three of which are to be made water-tight within the air chamber. Each frame will have a manhole cut in the web so that free access can be had to all parts of the leaf. All the horizontal girders except the bottom girders are to have similar manholes.

The water-tight frames between the girders have on one side a continuous angle which will be crimped over the flange angles of the horizontal girders. This crimping is done in such a manner as to obtain a close fit on both sides of the bounding angle to the adjoining structural parts, to obtain good contact for caulking. This angle is shop-welded at the splice, and where "V" sections are removed at the corners. The intercostals consist of ship channels and angles.

G. O. Newman, chief engineer of the Pacific Light & Power Co., of San Francisco, announces that the company will soon undertake the erection of a hydro-electric plant, which will generate 300,000 horsepower. Plans are being prepared and the machinery specifications will be ready in a few months.

Will Improve Dock Properties

Milwaukee, July 18.

Two Milwaukee coal companies are preparing for improvements which will make their docks among the largest receiving plants in the world.

The Milwaukee-Western Fuel Co. has just awarded the contract for constructing a new unloading dock at the foot of Washington street to replace the present dock, to the Heyl & Patterson Co., of Pittsburg, at a price said to be in the neighborhood of $450,000. The dock will be 900 feet long and will have two travelers, 350 feet long.

The Pennsylvania Coal & Supply Co. also has just awarded contracts for the construction of a huge unloading dock, which will be installed at South Canal and Sixteenth streets, the Whitnall dock. It will cost $500,000 and be in operation Sept. 1. The dock will be 750 feet long, with two 450-foot conveyors. The contracts have been awarded as follows:

Milwaukee Bridge Co., structural iron and assembling; Allis-Chalmers Co., electrical equipment; Pawling & Harnischfeger Co., cranes and conveyors.

Finishing Operations of Corporation Show Gains

Ingot operations of the United States Steel Corporation have again reached 70 per cent of full capacity, the point at about which the steel works were active preceding the cessation of the Fourth. During the past two months, the Corporation has been producing more than a million tons of ingots monthly and the present outlook seems favorable for a continuance of this scale of activity. Blast furnace operations this week are about 64½ per cent. Another of the Ensley furnaces of the Tennessee Coal, Iron & Railroad Co. has been ordered into blast, making five in all operating at this plant. Stocks accumulated by the furnaces over the Fourth are again being reduced through the heavy demands for steel by the finishing mills.

Leenhouts & Guthrie, architects, Milwaukee, are preparing plans for a $50,000 manufacturing building as an addition to the plant of the Chain Belt Co., 736 Park street, Milwaukee. The building will be two stories, 80 x 250 feet in size, of brick and steel construction. It will be devoted to the manufacture of elevator casings and concrete mixers.

FARRELL RETURNS

In a Hopeful Mood—Schwab Tells About Armor Plate Contract.

New York, July 20. (By wire.)

Jas. A. Farrell, the president of the United States Steel Corporation, arrived here this morning on the steamship Olympic. He said to a representative of the New York News Bureau: "The steel conference of Brussels was regarded by all present as evincing a desire to establish friendly relations and the discussion of technical, economical, ethical and sociological questions as applied to the industry. This would afford an opportunity for the interchange of opinions and information between the producers of the world affecting all matters relating to the industry."

"Business conditions," said Mr. Farrell, "as affecting the iron and steel industry in foreign lands are in an exceedingly prosperous condition. In Great Britain and in other steel producing countries, demand is larger than at any time in the history of the industry. Concurrent with this situation as affecting the markets of Europe there extends a large demand from the non-manufacturing countries of the world and as a consequence exports of iron and steel all over the European countries are on a gradually ascending scale. The iron and steel manufacturers of the United States are increasing their exports to a corresponding ratio and the course of the steel business in the United States promises to be one of steady improvement. I look forward to a gradual increase in production." Mr. Farrell points out the fact that the world at large is undergoing one of the most prosperous cycles in its history. This will ultimately affect the United States, rich in its enormous resources.

Chas. M. Schwab, president of the Bethlehem Steel Co., was also a passenger on the Olympic. He confirms the report that his company has closed a contract with the Italian government on behalf of his company and the United States Steel Corporation to furnish a very large tonnage of armor plate. The price obtained, he said is higher than that paid by the United States government for similar material. The delivery will begin at once.

Francis M. Osborne, Cleveland, who controlled important interests in coal mining operations and who was one of the founders and the first president of the Pittsburg Coal Co., died in Cleveland, July 17.

Personal

J. A. Bennett has resigned as chief engineer of the Studebaker Corporation's plant at South Bend, Ind.

Edward Hawkridge, president of Hawkridge Bros. Co., Boston, has left for a two-months' stay in Europe.

W. G. Wilcoxson has been appointed sales manager of the Grip Nut Co., Chicago, with offices in the Old Colony building.

H. A. Smith, of Tucson, Ariz., is at the head of a company which will construct a large power plant at Noria, Sonora, Mex.

G. W. Deats has been appointed master mechanic at Fort Worth, Tex., for the Texas & Pacific and International & Great Northern roads.

J. C. Manternach, of the tube department of the Standard Welding Co., Cleveland, has been appointed manager of sales of that company.

William B. Jones, auditor of the Youngstown Sheet & Tube Co., Youngstown, O., has announced himself as a candidate for the mayoralty of that city on the Republican ticket.

R. A. Rung, of the New York sales office of Schuchardt & Schutte, has taken a position in the sales department of the Allied Machinery Co., with headquarters in Vienna, Austria.

Prof. Louis D. Huntoon, formerly of the department of mining and metallurgy, Sheffield scientific school, Yale university, has opened an office at 42 Broadway, New York City, as a consulting engineer.

W. N. Billenstein, president of the National Iron & Wire Co., Cleveland, is recovering from the effects of an operation for appendicitis which he underwent July 9. He is still confined in the Glenville hospital.

T. W. Guthrie, formerly president of the Republic Iron & Steel Co., has been made general manager of the Standard Welding Co., Cleveland, succeeding the late W. S. Gorten, who was killed a few months ago in an automobile accident.

J. W. Small, formerly superintendent of machinery of the Kansas City Southern, has been appointed to a similar position with the Missouri Pacific at St. Louis. M. F. Cox has been appointed mechanical engineer for the Louisville & Nashville railroad.

Howard H. Maxfield, master mechanic of the Trenton, N. J., shops of the Pennsylvania railroad, has been appointed to a similar position in the shops at Pittsburg. W. B. Ott, formerly assistant engineer of motive power at Jersey City, has been appointed to succeed Mr. Maxfield.

Obituary

James Taylor, aged 81, who retired in 1892, after having been identified with the Hubbard, Lippincott & Bakewell Mfg. Co., Pittsburg, died July 11 at Pittsburg.

Charles S. Eaton, brother of Frank and Will Eaton, prominent in pig iron circles in Cincinnati, died at his home in Olympia, Wash., July 14. Mr. Eaton was associated with the selling agency of Thos. A. Mack from 1893 to 1900 and later went to Washington to go into the lumber business. He is survived by his wife. Burial will be at Olympia.

Major James C. Brooks, aged 67, president of the Southwark Foundry & Machine Co., Philadelphia, died in a Philadelphia hospital July 18, following a sudden attack of heart trouble. For many years, he was associated with William Sellers & Co., and became a partner. He severed his connection with that firm in 1887, to take the presidency of the Southwark company.

Harry A. Fennerty, purchasing agent for the Carnegie Steel Co., Pittsburg, died July 13 at his home, Elgin avenut, East End, Pittsburg Mr. Fennerty was born in Pittsburg and was a son of William J. Fennerty. At an early age, he became identified with the Pennsylvania railroad and about 23 years ago started in the foundry department of the Carnegie-Phipps Co. He served in various capacities of the Carnegie Steel Co., and was appointed purchasing agent 14 years ago.

Increased Interest in Pig Iron Warrants

New York, July 15.

Dealers in American pig iron warrants report there is an increased inquiry at the present time in this form of speculation, although prospective buyers are still acting cautionsly in the placing of orders, in the belief that further declines in southern pig iron will ensue. There is an evident appreciation upon the part of these speculators that southern iron at $10 Birmingham is a low price and offers considerable attraction for a venture, but because of the recent decline in the market, a good many of these investors are not inclined to offer over $9.75 Birmingham for the war-

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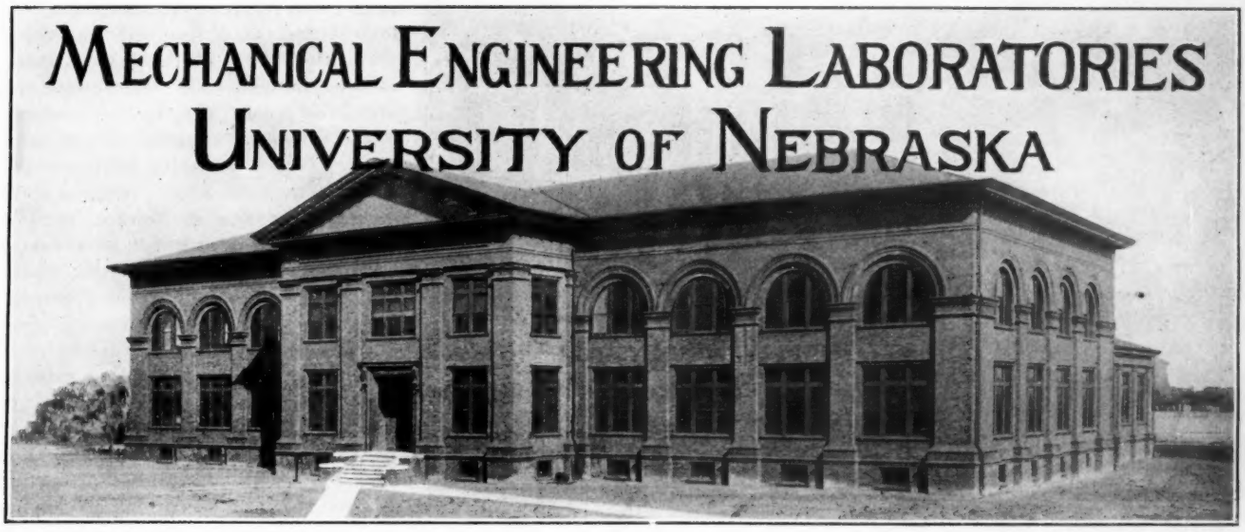
The Gray Iron Works at Columbia, Ill., employing 200 men, was destroyed by fire of incendiary origin July 14.



Equipment of a Modern Engineering School

With the completion of a new mechanical engineering building, the various mechanical engineering laboratories of the University of Nebraska, Lincoln, Neb., have been located under one roof. In style of architecture, the building may be classed as a modification of the Roman Doric, which gives to the exterior an appearance of massive stability. The interior construction of the building is of the most substantial character, the floors being of reinforced concrete throughout, carried by heavy steel beams which are supported by steel columns. Since the building is primarily for laboratory purposes, the floors were made heavy enough to carry the large weight of moving machinery which comes upon them. The building was designed and the various laboratories were arranged by Dean C. R. Richards.

The front portion of the building contains a high basement and two stories. The rear portions are one story high. The basement of the main portion of the building will contain the steam tunnels, the plenum room for the ventilating machinery, a portion of the equipment for the power laboratory, and ultimately, a large laboratory for experimental and research work in the transmission of power.

The first floor of the building contains the large power laboratory, 76 x 87 feet; machinery tool laboratory, 54 x 87 feet; forging laboratory, 44 x 60 feet; foundry laboratory, 74 x 60 feet; the men's lavatory, 30 x 50 feet, and the tool room. The second floor contains two large lecture rooms, a drawing room, 23 x 65 feet, the fuel testing laboratory, the wood-working laboratory, 54 x 87 feet, and the offices of the dean.

The power laboratory contains the following important pieces of apparatus: A 4 x 6-inch vertical throttling

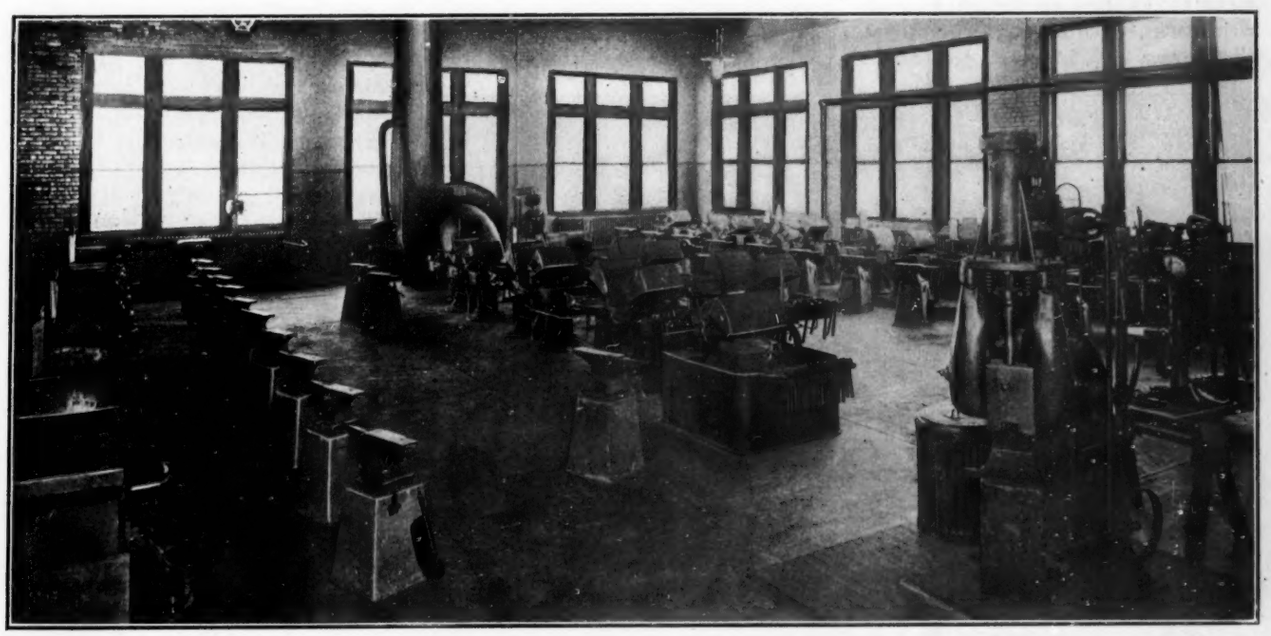


FIG. 1—FORGING DEPARTMENT OF THE MECHANICAL ENGINEERING LABORATORIES OF THE UNIVERSITY OF NEBRASKA

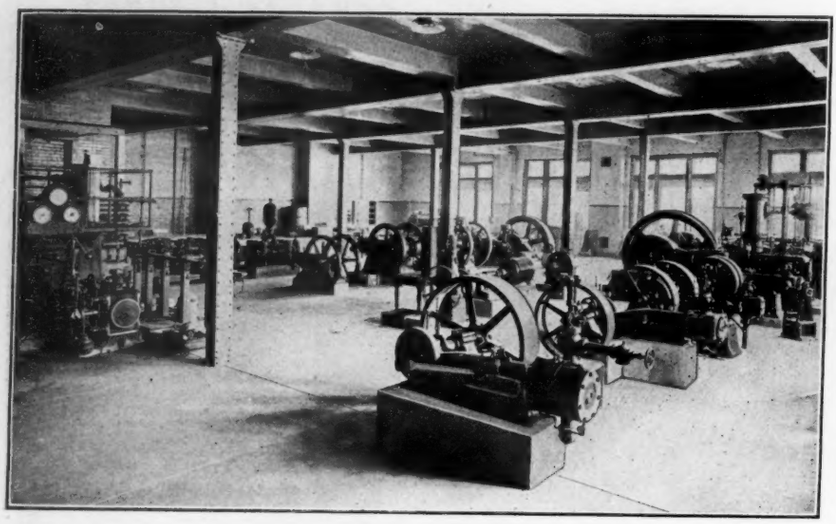


FIG. 2—A VIEW OF THE POWER LABORATORY

engine; 7 x 10-inch and 10 x 12-inch horizontal throttling engine; 7 x 10-inch and 6 x 8-inch, high-speed automatic engine; 20-horsepower Kerr and 20-horsepower Terry steam turbines; 10 x 20 x 24-inch cross-compound condensing Corliss engine; 65-horsepower cross compound, two-stage, Meyer valve gear type air compressor; 8-horsepower hit and miss gas engine; 14-horsepower automatic gas engine; 18-horsepower Mietz & Weiss oil engine; 50-horsepower Smith suction gas producer connected to a 50-horsepower tandem, heavy-duty Buckeye gas engine; 10-ton refrigerating machine, complete with freezing tank and other apparatus for the manufacture of ice. The hydraulic apparatus in this laboratory consists of a reinforced concrete cistern holding about 15,000 gallons of water, surmounted by two reinforced concrete weir tanks, each having a cross-sectional area of 25 square feet and a length of 27 feet; a steel pressure tank, 5 feet in diameter by about 35 feet high, receiving water pumped from two motor-driven turbine pumps and from a large compound duplex steam pump. In addition to the foregoing, the laboratory is provided with a complete Westinghouse and New York air brake outfit, together with steam calorimeters, indicators, gages, absorption and transmission dynamometers, calibrating apparatus, etc.

Of the apparatus enumerated, a number of pieces are of noteworthy interest, and demand a more detailed description. The experimental Corliss engine, built by the Murray Iron Works, has been provided with every conceivable device and attachment for the widest possible range of experimental and research work. Either cylinder may be operated as a single engine, or the two, as a compound engine. Both the high and low pressure cylinders have steam jackets on their barrels and heads, so arranged that either head, or the barrel, or all, may be charged with steam under any pressure up to the boiler pressure. When operating compound, a re-heating receiver is provided and arranged so that the re-heating coils may be cut into or out of service at will. Each cylinder is provided with double eccentrics, giving a very long range of cut-off under the control of the governor. The governor itself is provided with ten governor pulleys so that the speed of the engine may be varied from 60 to 150 revolutions per minute. The fly-wheel, which is 8 feet in diameter by 16-inch face, is provided with inwardly projecting flanges for the reception of cooling water required when the power is absorbed by a friction brake. On the whole, this is one of the most complete experimental engines so far installed.

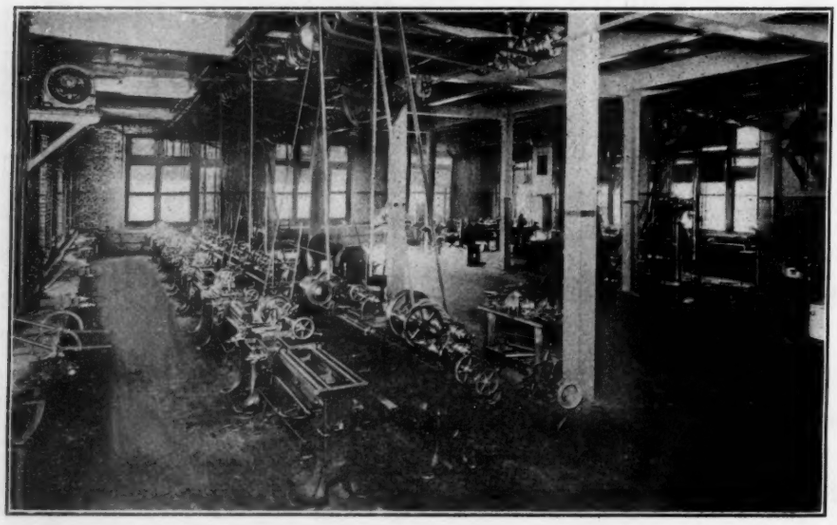


FIG. 3—MACHINE TOOL LABORATORY

Gas Producer.

The gas producer and the producer gas engine are designed to make possible research work in the generation of power by such apparatus, utilizing a wide variety of fuels. The producer is a special type, designed to operate on all fuels from peat to anthracite. It is arranged to work up-draft on those fuels which contain but little tar and by a simple change in the piping, to work down draft on those fuels which are rich in tar. A centrifugal scrubber is provided for cleansing the gas and for removing any tar which may not have been broken up during the formation of the gas. It should be noted that with a producer available for all kinds of fuel, the opportunity is presented for a very wide range of research work upon the adaptability of fuels to the manufacture of producer gas. The engine is of a peculiarly massive type, the fly wheel being 7 feet in diameter and weighing 9,000 pounds. The engine is governed by varying the quality of the charge and the point of ignition simultaneously. It is started by compressed air delivered by a small air compressor driven by a 4-horsepower gasoline engine. The other internal combustion engines mentioned make possible a complete and careful study of the application of gas, gasoline, kerosene and crude oil in the generation of power.

The pumping equipment used in connection with the hydraulic apparatus consist of two three-stage turbine pumps, each connected to a 50-horsepower, variable speed induction

motor and each capable of pumping 400 gallons of water per minute against a pressure of 100 pounds per square inch. These pumps are so connected that they may be operated in multiple, delivering 800 gallons per minute against 100 pounds pressure, or in series, delivering 400 gallons per minute against 200 pounds pressure. In addition to the turbine pumps, there is provided a large, compound duplex steam pump, having a capacity of 300 gallons per minute against 200 pounds pressure. This pump is arranged to discharge into the same pipe with the turbine pumps, making the total pumping capacity available 1,100 gallons per minute. The discharge from the several pumps is delivered into a steel pressure tank and from this tank the water is available for experimental work in connection with the flow of water through orifices and nozzles and for the testing of hydraulic motors. After issuing from the pressure tank, the water falls into one of the two weir tanks provided with weir notches of various sizes and shapes. After flowing over the weir notch the water is delivered alternately into either of two steel weighing tanks, from which it is dumped into chutes and returned to the cistern below the weir tanks.

Steam Condensing Outfits.

Two steam condensing outfits are provided and the exhaust piping from the engines is so arranged that steam from any engine may be delivered into either condenser. It thus becomes possible to operate any two steam engines, condensing, and at the same time every other engine in the laboratory may be operated non-condensing. Much thought has been given to the piping arrangements in the laboratory.

The fuel testing laboratory is provided with a considerable variety of apparatus for testing the heating value of solid and liquid fuels and gases, together with apparatus for the testing of lubricants. The laboratory contains, among other important instruments, a complete Mahler bomb calorimeter, a Carpenter, Barrus and Thompson coal calorimeter, and a Junker and Sargeant gas calorimeter.

In the various shops in the building, the equipment has been planned, so far as possible, to make the work real laboratory work rather than mere manual training. The freshmen students spend their time in the wood-working and foundry laboratories, where they become familiar with the

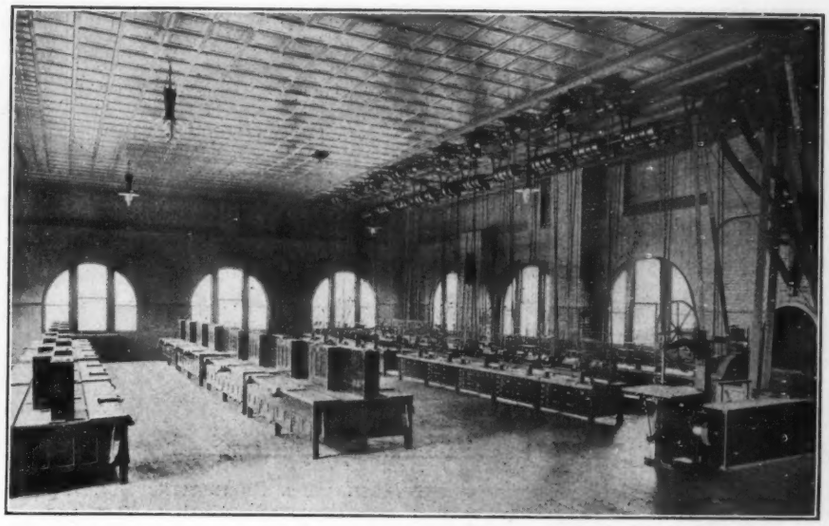


FIG. 4—WOOD-WORKING LABORATORY

processes involved in the handling of wood at the bench and at the lathe, and where, particularly, they become familiar with the construction of patterns for machine parts. In the foundry, these patterns are molded in sand and castings are obtained in iron or brass. In the forge room, the student become familiar with the various forging processes involved in the handling of iron and steel, while in the machine shop the final construction and erection work is taught the student.

The wood-working laboratory contains 32 benches, each equipped with a set of carpenter's tools, 40 speed lathes, each provided with four sets of turning tools, and, in addition, the following machines: Pattermaker's lathe of large size, surfacing planer, combination cross-cut and rip saw, band saw, jig saw, etc. It is interesting to note that of the speed lathes in this laboratory, a majority were constructed in the shops of the department.

The foundry contains two rooms, the core and cupola room and the molding room. In the former are placed two cupola furnaces, a large core oven, the storage bins for materials, the casting rattler and core benches. A foundry elevator is arranged to hoist materials to the concrete platform, where they may be readily dumped into the furnaces. Blast for the furnaces is supplied through a direct-connected, motor-driven, two-stage blower of the latest design. In the molding room is done the regular work in molding and casting. The room is large and very well lighted and ventilated. It is spanned by a 5-ton traveling crane, so that work of considerable size may be handled with ease. Besides the molding benches, the room is pro-

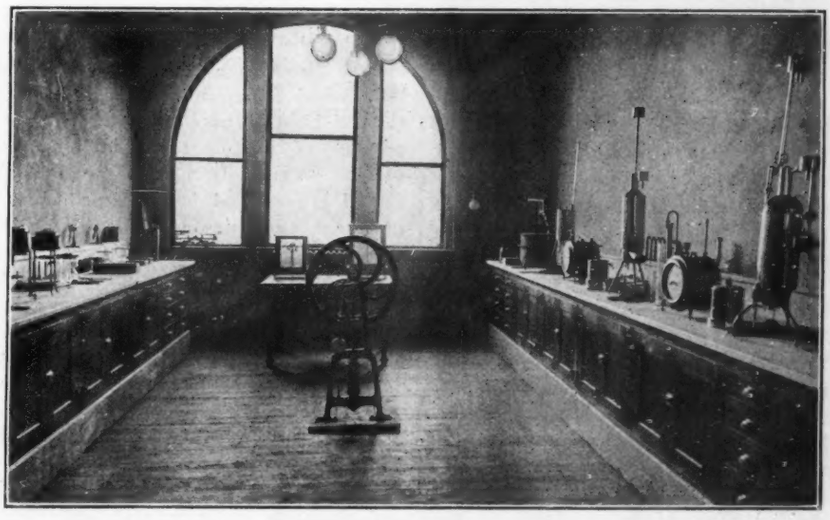


FIG. 5—FUEL-TESTING LABORATORY

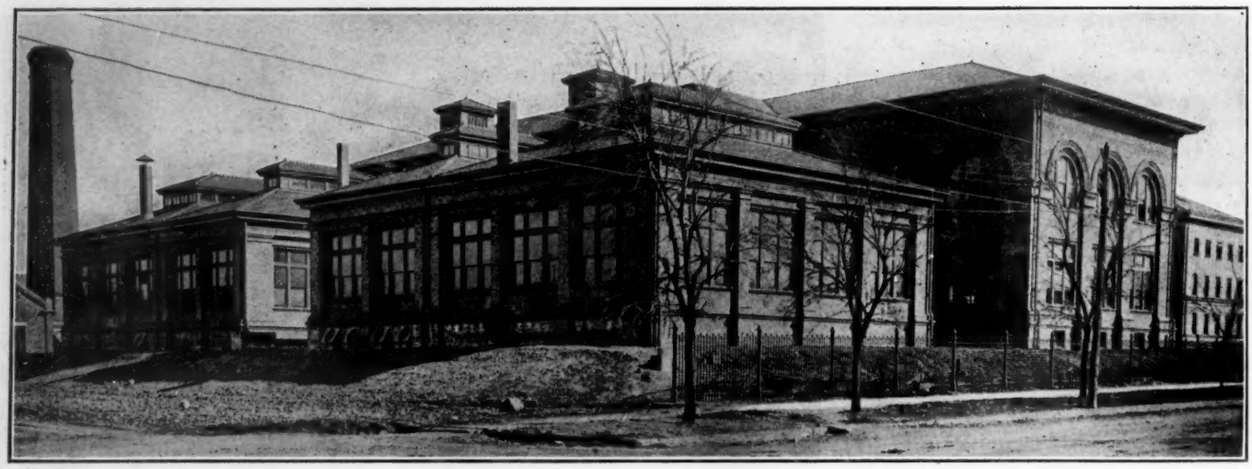


FIG. 6—REAR VIEW OF THE MECHANICAL ENGINEERING BUILDING OF THE UNIVERSITY OF NEBRASKA

vided with two brass furnaces, power sand sifters, etc.

The forging laboratory contains 35 down-draft forges, each supplied with a complete set of blacksmith's tools. The blast is supplied by a direct-connected motor-driven blower and the smoke removed from the room by a large exhaust fan driven by a Morse silent chain from an induction motor. This laboratory has, besides the apparatus just mentioned, a 200-pound steam hammer, a hand-operated punch and shear, a 20-inch drill press and an emery grinder, these latter being driven from a line shaft, operated by a small induction motor.

The machine tool laboratory contains 15 screw-cutting engine lathes, from 14 to 20-inch swing. About half of these machines are provided with quick-change gears for screw cutting. The laboratory also contains one universal and one plain milling machine of the latest type, a large universal grinder, a universal tool and cutter grinder, a 24-inch x 24-inch x 8-foot planer, two shapers, two sensitive drill presses, a 26-inch drill press, a 3-foot radial drill, a pipe-threading machine, a circular cold saw machine, a power hack saw, gas furnace, a key-seating machine, together with an assortment of grinding machinery. On three sides of the room are placed work benches fitted with machinists' vises. The room is divided by columns into three bays. In the south bay are placed lathes and in the north one the other machine tools. The center bay is left for an erecting floor and will later be provided with a small traveling crane to facilitate the handling of heavy parts of machines. Adjoining the machine tool laboratory is the tool room, which contains all of the small supplies, tools, materials, etc.

The drawing room is provided with 15 drawing tables, each with six individual drawers and a drawing board capacity for six boards. The drawing room contains, in addition to the drawing tables, a large electric blueprinting machine, wash sink and drying racks. The large assembly or lecture room is provided with a sloping bowl-shaped floor, so that each of the 196 seats is equally good. This and the other lecture rooms in the building are arranged so that the windows may be darkened and a lantern used at will.

Blast Furnace Slag in Concrete

The report of an exceedingly interesting and valuable series of tests to determine the practicability of blast furnace slags for use in concrete is contained in a 32-page pamphlet issued by the Carnegie Steel Co., Pittsburg. There is produced annually in the United States more than 10 000,000 tons of blast furnace slag and, while a portion of this material is used in various ways, only a small portion of the slag produced is consumed, leaving large quantities available for other uses as substitutes for stone and kindred materials. The motive that prompted this investigation was the knowledge that almost any hard substance that has strength and will not readily disintegrate would make a good aggregate in concrete. In making the tests it was found that the commonly employed portions of one part of cement to three parts of sand and six parts of aggregates fairly represented the demands of theory and it was decided to adopt arbitrarily this proportioning throughout the entire series of tests.

The specimens were molded in sheet steel cylinders and were 12 inches in diameter and 16 inches in height. The specimens were sprinkled with water daily for the first 27 days and a total of 20 specimens of each combination was made and at least three were subjected to compression tests at each age interval. With the exception of a few two-year old specimens made with bank slag screenings all tests were made on a 400,000-pound Olsen machine at the Homestead Steel Works. The mixtures containing river sand and gravels were regarded as standard and as a rule bank slags tested higher than either gravel or limestone. Bank slag No. 1 with river sand developed the greatest strength of all the coarser aggregates and bank slag No. 2 with river sand ranked second and slag aggregates compared favorably with the gravel standard and both bank slag aggregates, with either river sand or slag sand No. 2, as a result of these tests, can be recommended for general work. The machine slag is recommended for light construction where maximum strength is not essential. Bank slag screenings and especially the No. 2 or coarser grade, developed remarkably high strengths and are probably the best materials for reinforced concrete when lightness of construction with maximum strength is required.

Slag sand No. 1 is made at the Carrie furnaces of the Homestead Steel Works by an improved method which may be briefly described as follows: The molten slag is delivered from the funace through a trough or runner to a concrete pit, at the edge of which the trough takes the form of a large nozzle, fitted with an annular ring, from which water issues in the form of spray delivered through a four-inch

pipe under pressure of from 30 to 40 pounds per square inch. This causes the disintegration and partial cooling of the slag, which operations are further accomplished by the water with which the pit is partly filled and by the force of the impact with which the slag is thus driven against the opposite wall of the pit. In appearance, this granulated slag resembles slag sand No. 2, except that the largest particles are much smaller and the entire product is somewhat more dense.

Slag sand No. 2 is made by running the molten slag directly into a tank or concrete pit, partly filled with water, in which the disintegration of the slag is accomplished by contact with the water. This product contains many light particles in addition to those of finer and denser character and much of it is as coarse as popped corn. The river sand used in these tests was dredged from the rivers in the Pittsburg district.

Bank slag is air-cooled blast furnace slag excavated from the waste banks, where months before, the molten slag had been poured and allowed to accumulate and gradually cool.

Greene Differential Positive Blower

In the development of the high pressure blower experimenters have sought improvement along many lines, but during the last few years, most of their effort seems to have been directed toward perfecting the gear blower, a type in which two sets of impellers are mounted on separate shafts and controlled in their rotation by external gear wheels. Having developed this type into a practical machine, attention has naturally turned toward the perfection of a design in which the gear wheels and double sets of impellers could be eliminated. A blower embodying these characteristics which has recently been perfected by Ambrose E. Greene, Chicago, is illustrated herewith.

This machine has three impellers, mounted to rotate with a shaft which is concentrically mounted within a circular casing. One of the impellers is rigidly keyed to the shaft and the others, swinging on hinges, are so connected by a link motion that their speeds are varied so they alternately move faster and slower than the shaft, thereby increasing and diminishing the volumes of the three chambers into which the impellers divide the casing. By a proper arrangement of the inlet and exhaust ports, air, or other fluid, drawn into the chambers as their volumes increase is expelled under pressure as their volumes decrease.

The details of construction and method of operation of this blower may be seen by referring to the accompanying illustrations. Fig. 1 is a sectional view of the blower, in which the filling blocks have been removed in order to show the construction more clearly. The shaft, *S*, extends through the center of the casing and is journaled in ring-oiling bearings in the cylinder heads. The three impellers are mounted on this shaft, with just sufficient clearance on all sides to permit them to rotate freely within the casing. One of the impellers is rigidly keyed to the shaft. Their relative speed is varied by interconnecting them with three pins, *P*, which extend between the two rotary rings, *R*, each of the impellers being connected to one of the pins by means of one of the oscillating links, *L*. The two rotary rings are mounted in opposite annular channels cut in the cylinder heads, their axis of rotation being eccentric with the axis of the shaft. It will be seen that in their rotation, the relative speeds of the impellers will be varied as the pins, *P*, to which they are attached, are alternately carried closer to and farther away from the center of the shaft, *S*. Therefore, the chambers formed by the impellers will alternately increase and diminish in volume, thus drawing in and forcing out air, or other fluid. Segment-shaped blocks, one of which is secured to each impeller, serve to fill up the space which remains between any two impellers when they are closest together, and thus prevent carrying any appreciable amount of compressed air from the exhaust side back to the inlet side. These blocks are, in the case of the machine shown in Fig. 3, made of wood, but might preferably be made of hollow metal. When the machine is used as a liquid pump the blocks are dispensed with.

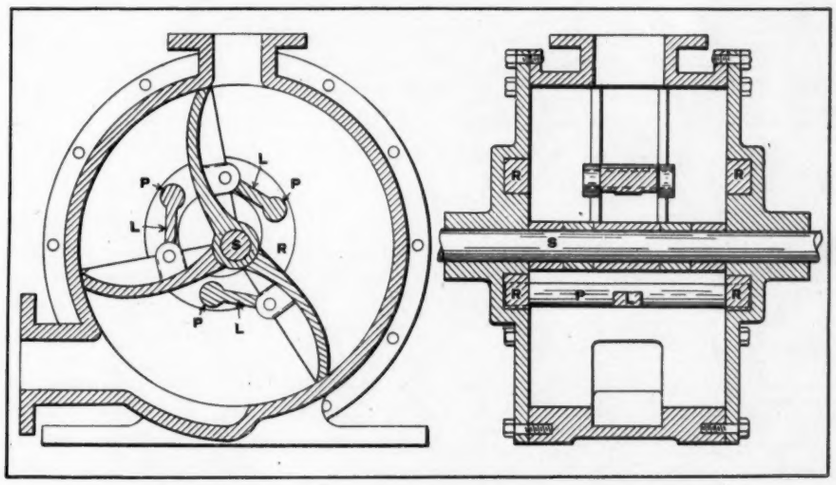


FIG. 1—SECTIONAL VIEWS OF GREENE BLOWER

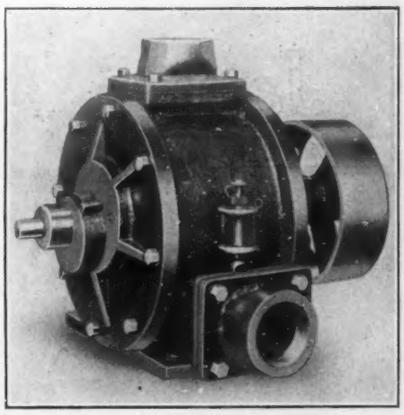


FIG. 2—GREENE DIFFERENTIAL BLOWER

The chief advantages claimed for this blower are that the various revolving and oscillating parts are retained by bearings close to their centers of rotation and oscillation, which is at a point where the velocity is lowest and that the impellers do not come in contact with the casing.

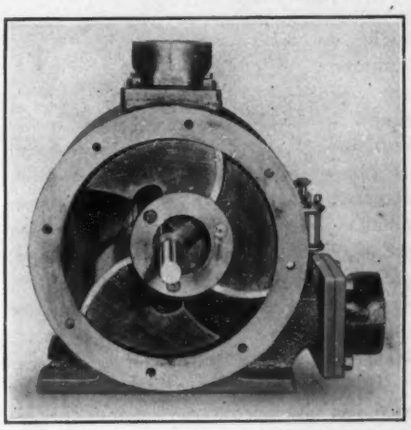


FIG. 3—END VIEW OF BLOWER WITH COVER REMOVED

James A. Farrell — Master of Detail and Hard Work

How Devotion to Duty and Persistent Enterprise Made a Wire Mill Workman President of the United States Steel Corporation

By C. J. Stark

Somewhere in the careers of those who have become pre-eminently successful in their life's work, there stands out clearly some cardinal principle, some underlying rule of action upon which their accomplishments have been founded.

In the case of James A. Farrell, president of the United States Steel Corporation, this distinctive quality may be epitomized in two very expressive words—*hard work.*

For 34 years, or since the start of his active career at the age of 14 in a lowly capacity in a New Haven, Conn., wire mill, Mr. Farrell has incessantly followed the principle that nothing is more productive of results than good, steady and persistent application to duty. Now at the age of 48 as chief of detail of the management of the daily operations of the world's largest industrial corporation, he is still an ardent disciple of this school.

There are many to whom the office of president of the United States Steel Corporation suggests a picture of spacious and luxurious offices, of short hours and of a daily business life characterized by a minimum of exasperating details. A visit to 71 Broadway at six, seven and not infrequently at eight o'clock most any evening would serve as a sermon for such. At these hours, when even the common laborer has called it a good day's work, Mr. Farrell may still be found at his desk, energetically applying himself to the routine of his office or concentrating his mind with characteristic vigor upon the multifarious details surrounding the day-to-day management of the world's greatest steel producer. In the morning, it is not unusual to find him opening his mail at eight o'clock, nor is an interview with large customers and the closing of an important transaction by 8:30, an extraordinary incident of his day's routine, all of which is grotesquely out of line with the popular notion of the short work hours of the New York business man of large affairs. And it is not so much that the public greatly errs in such belief as it is that Mr. Farrell has a characteristic way of not letting himself be bound by general rules.

"I never consider it a full day's work under 12 or 14 hours," said Mr. Farrell recently.

It is such a *system* that has made James Farrell the successful business man that he is.

"Who Is James A. Farrell?"

When in January last, Chairman Gary of the Steel Corporation, made the announcement rather unexpectedly that the board of directors had fixed upon the successor of William Ellis Corey and gave to the public his name, more than one steel manufacturer turned to his associates with the query, "Who is James A. Farrell?" To the general public, the new president was a genuine stranger. It is related that the New York newspapers frantically searched their files and *morgues* for sketches and photographs of the new *industrial king.* But they found none. James Farrell's work in life had been accomplished so quietly and with so little display, but yet so surely, that he had been little within the spotlight of public interest. When the reporters went to the Brooklyn home to inquire into his life apart from that of his office, they found there what was necessary to complete the picture of success—the happy home circle of the best type of the well-to-do American citizen.

Perhaps none was more surprised by the announcement of his election than Mr. Farrell himself. As president of the United States Steel Products Co. he had just been reviewing with pardonable pride the excellent record of his company during the past year, and was pluming himself and his organization for greater conquests of trade in the world's markets when the news of the action of the directors was broken to him.

"Had I known a day ago that I was to be president of the United States Steel Corporation, I would have had a sketch of my life and plenty of photographs of myself prepared," was the way he met the throng of newspaper and magazine representatives that besieged his office following Judge Gary's announcement.

Bigness is a dimension that readily and admirably applies to the new Steel Corporation president. Big in mind and body, he seems peculiarly fitted for the close application to business and for the capacious grasp of detail that has been his stock in trade so many years. Bigness is one of the surmounting qualities of his whole character. In all his business dealings, he is at once affable and gracious to those who have proper occasion to take his attention in his daily work. Possessed of a kindly eye and warming smile, there lingers with the caller after an interview the impression of a genial personality. His business conduct has been a genuine, living example of the *square deal.*

About the time Mr. Farrell's selection as president of the Steel Corporation was announced, a largely-attended meeting of steel manufacturers was held in New York. Practically all the important steel companies of the country were represented by their principal executive officers. At the call for responses, one of the leading independent steel makers arose and tendering his respects to the new Steel Corporation president, paid Mr. Farrell his highest compliments in the straightforward manner of a business man of large affairs when, in speaking of the business relations and the class of competition his company had had with the export subsidiary of the Steel Corporation, he said, "I have found Jim Farrell's word to be as good as gold." Starting with this spontaneous tribute came a wave of kindliest ex-

JAMES A. FARRELL, PRESIDENT OF THE UNITED STATES STEEL CORPORATION

pression that fairly swept the banquet room and before it had subsided, practically every steel manufacturer present, with whom Mr. Farrell had had business relations, had added his word of high regard for the latter's integrity and square dealing.

"Jim Farrell could have the check book of my company signed in blank," was the way the president of one of the largest independent steel companies of the country framed his eulogy. The tribute from his competitors, spontaneous and unexpected as it was, marked the most impressive feature of this gathering.

Fair Competition the Life of Trade.

In a recent address dealing with the methods to be followed for the broadening of the foreign commerce of the United States, Mr. Farrell expressed this view:

> In the development of our trade, we should endeavor to obtain our full share of business by fair and honorable means and with due regard to the rights of those with whom we are trading. The saying, "Competition is the life of trade" is a truism to which daily utterance is given. Were this changed to *"Fair* competition is the life of trade," it would more correctly represent the basis upon which sound and lasting business relations may be established.

The ethical principles embodied in this utterance afford a true measure of the individual.

A Master of Export.

It has been said that no steel manufacturer of tthe United States is better or more favorably known in foreign countries than Mr. Farrell. Such a statement is not putting it too strongly. A large portion of his business career has been conducted not along the grooves of trade in the interlaced and interdependent industrial system of this country, but in winning of new commercial victories in markets unexplored when considered from the standpoint of American steel-making, amid peculiar conditions and against obstacles of prejudice, of custom and of speech. It is deserving, therefore, and highly complimentary, that he should be best known for his achievements in the world's markets. He has to his credit a record of surpassing accomplishment as a winner of foreign trade. From the modest figure of less than 200,000 tons at the formation of the United States Steel Products Co. in 1903, the export business of the United States Steel Corporation has expanded to the handsome total of 1,225,000 tons in 1910, and bids fair this year to reach and possibly exceed the unprecedented figure of 2,000,000 tons. This wonderful growth in business volume, representing a money equivalent of at least $75,000,000 annually, reflects the scope and capacity of the United States Steel Products Co. Mr. Farrell personifies the export subsidiary of the Steel Corporation. This company with its representatives in 55 different foreign trade centers is primarily the product of his ingenuity, far-sighted wisdom and persistent enterprise.

Mr. Farrell's Rapid Advancement.

It is a familiar saying in the steel trade that whatever Mr. Farrell says of the export markets can be absolutely depended upon, for he knows. No other steel man in this country has had his broad experience in dealing with the trade needs of different peoples beyond our borders, or has given such thoughtful and constructive attention as he to the questions of production or of distribution to these markets. Whether the particular requirement pertains to the best form of wire for fencing the fertile plains of Argentine or to the most serviceable type of rails or bridges for the steam roads of Japan or the Orient, Mr. Farrell has at once the proper recommendation for his customer gained by long and direct contact with the actual conditions and needs of these different lands.

When in 1899, Mr. Farrell became foreign sales manager for the American Steel & Wire Co., his training and experience had included more than 20 years of practical steel manufacture acquired in high and low posts of duty in the mills. Born in New Haven, Conn., Feb. 15, 1853, he received his education in the public schools of his home city, and entered the employ of the New Haven Wire Co. in a lowly position as a youth of 14. Soon he became a wire drawer and he rapidly rose by gradual promotion and development to the assumption of work of greater executive responsibility and trust. Pittsburg beckoned to him in 1890, and at the age of 27 he became night superintendent of the Oliver Wire Co., and finally day superintendent. In that wonderful territory of enterprise and expansion in the steel business known as the Pittsburg district, Mr. Farrell found his own. In four years, he became a manufacturing producer himself when, with other capitalists, he organized the Pittsburg Wire Co. and built a mill at Braddock, Pa., for the manufacture of wire rods, wire and wire nails. As general manager of the company, he made his plant a real factor in its branch of the trade, so much so that the American Steel & Wire Co., gathering the scattered wire-making units into one corporation, absorbed both the Pittsburg Wire Co. and the Oliver Wire Co. With this development, the activities of the rising young steelmaker were transferred wholly to the export field. In 1899 he became foreign sales manager of the American Steel & Wire Co., devoting his attention to the building up of the demand for American wire products in the markets of the world. Two years later, when the American Steel & Wire Co. became a component part of the United States Steel Corporation, the importance of the export department was infinitely broadened through the addition to its lines of selling of a long list of various steel products representing the different manufactures of the subsidiary units of the great corporation.

Export Subsidiary is Formed.

The export trade expanded so widely that in October, 1903, a separate export subsidiary company of the Steel Corporation was created, known as the United States Steel Products Exports Co., which has become, at this date, the United States Steel Products Co. From its formation until his elevation to the presidency of the United States Steel Corporation, Feb. 1, 1911, Mr. Farrell was president of this subsidiary and its organization and operations have been wholly under his supervision. He still exercises over it a guiding hand. He has traveled so extensively in foreign countries and has familiarized himself so intimately with the peculiar trade requirements of these different countries as well as their all-affecting political conditions, that his acquaintance and influence in the world's markets are far-reaching and upon the basis of cordial relationship and honest dealing, he has founded a business which has become not only of first importance in the affairs of the Steel Corporation, but likewise of considerable benefit to the steel industry and general prosperity of the entire United States.

The importance of an expanding export market needs no demonstration when considered with relation to the commonly-held belief of the steel makers of this country that the iron and steel capacity of the United States through a recent active period of new construction has over-reached the demands of the domestic market for several years to come at least. Mr. Farrell is one of those who views the field of foreign trade as a salutary as well

as a permanent source of support for our over-built capacity.

Speaking upon this subject before the Pan American Commercial Conference at Washington, several months ago, Mr. Farrell said:

> As anyone who studies the progress of nations can perceive, the producing capacity of the United States has reached a point far exceeding the consumption, and the ratio of excess is assuming greater proportions each year. It is, therefore, imperative for the manufacturers of this country to look beyond its borders for markets wherein they can profitably dispose of their manufactures, and, naturally, our geographical position points to the vast country lying to the south of us as a market which should enable us to secure a portion of the trade commensurate to our position as one of the foremost producing nations.

When Jim Farrell plays, it is neither for a long time nor often. By natural instinct and by training, his love runs to the water. Life and tales of the sea entered much into the Farrell family life in the youthful days of the present commander of operations of the Steel Corporation. His father, John G. Farrell, was a New Haven sailing master who periodically took his ship and cargo to the principal trading ports along the eastern coast, a captain of commerce for his day. Some analogy runs between the business pursuits of the elder Farrell and his distinguished son. Both have followed the course of commerce of the seas. The former personally saw to the distribution of the wares of trade, in his own ship, the custom of those prominent in the shipping industry of his day; the son supervises not only the sale but the distribution of the many and varied forms of American steel to all parts of the civilized world—not through a single ship nor a few vessels, but by a large fleet of modern freighters. The distribution of one or two million tons or more of steel products annually to different centers of trade of the world, is a big shipping business in itself, since much of it must be delivered by way of the seas. This detail, for it is a detail, though a most important one of the export trade, has come under Mr. Farrell's supervision as head of the export company, and he sees to it by his familiarity with the management of shipping as well as with the intricacies of an unstable and manipulative freight market that his deliveries are not interrupted and that vessels are at hand when he needs them without his being forced to pay prohibitive rates.

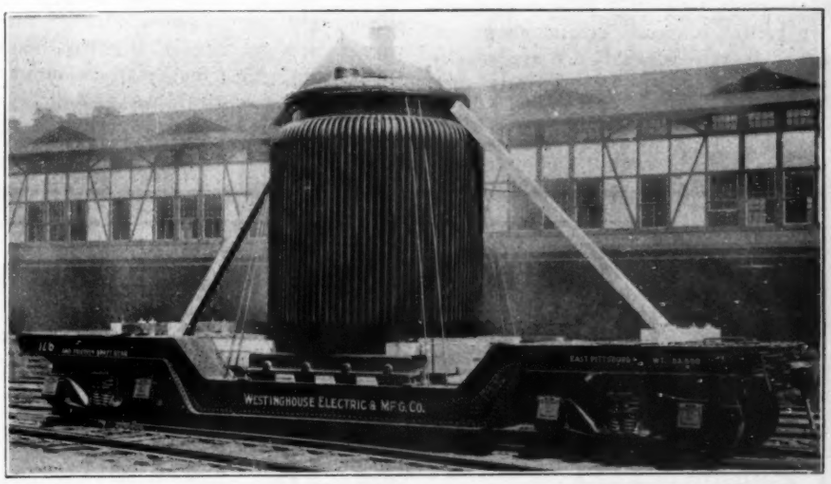
It is, therefore, a natural tendency that leads Mr. Farrell to devote a large part of his recreation hours to the pleasure of boating. There is nothing he enjoys more than a dash out into Long Island Sound in his catboat Eolis, or any small sail craft where he can have his hand on the tiller or on the sheet. In summer he enjoys his favorite pastime at South Norwalk, Conn., where the Farrell family has its summer home. And he sails hard and well as he does everything he undertakes, tacking and jibing with the skill of a sailing master. His sons are usually his boon companions upon these sailing expeditions.

The Farrell family consists of Mr. Farrell, Mrs. Farrell and five children—three sons and two daughters. The eldest child and son is about to enter college. The family residence is at 249 Garfield Place, Brooklyn.

A Novel Steel Freight Car

The steel car shown in the accompanying illustration is one of three cars of an entirely new design, recently delivered to the Westinghouse Electric & Mfg. Co., East Pittsburg, Pa., by the Atlas Car & Mfg. Co., Cleveland. These cars will be used for shipping large transformers completely assembled and ready for installation and immediate use upon arrival at their destination. The steady increase in capacity, size and weight of these transformers, rendered this mode of shipment more and more difficult and special cut-out steel cars, with strong center floors suspended at about axle height from heavy side frames, were built for the Westinghouse company some time ago. These cars have a capacity in the well of 70,000 pounds, but they proved inadequate for the large transformers of the type shown in the accompanying illustration and of which 15 were ordered at one time by the Southern Power Co. To facilitate the shipment of these transformers, it became necessary to obtain a car of an entirely new design, which is the joint product of co-operation between Westinghouse engineers and those of the Atlas Car & Mfg. Co., and which has received the approval of the engineers of the Pennsylvania railroad.

This car is of steel construction, 35 feet 5 inches long, and has a capacity in the well of 150,000 pounds. For a load that can be spread over the entire car on the end platforms, as well as in the center, the capacity is 205,000 pounds. Notwithstanding this great capacity, the surface of the floor in the well is only two feet, two inches above the tops of the rails, thereby affording a maximum amount of clearance under bridges. The car frame is constructed of heavy built-up steel girders and the trucks are of 205,000 pounds capacity with 6 x 11-inch journals and are equipped with 33-inch rolled steel wheels. The center plates are of wrought steel and the journal boxes, riders, brasses, etc., all conform to M. C. B. requirements for 205,000-pound capacity journals. Each car is equipped with Westinghouse air brakes and friction draft gear and weighs 53,000 pounds. The transformer shown on the car is of the oil-insulated, tubular, self-cooling type, and as loaded for shipment, the extreme top part of the transformer reached a height of 16 feet above the tops of the rails. On account of the height limitations of tunnels in the Allegheny mountains and at Baltimore, the transformer was shipped by a different route to the Southern Power Co.'s station at Newberry, S. C.



STEEL FREIGHT CAR BUILT ESPECIALLY FOR SHIPPING LARGE TRANSFORMERS

The Arrangement of Modern Casting Plants

The Layout of Small Steel Foundries From Five to Eight Tons Daily Capacity and a Pipe Shop of 30 Tons Capacity

The previous articles in this series have described successively layouts of gray iron, car wheel, malleable iron and brass foundries, also one combination gray iron and steel foundry. In this article will be presented layouts of two small steel foundries of five and eight tons daily capacity, respectively, and one pipe foundry of 30 tons daily capacity.

In a steel foundry one of the chief features of interest is the furnace and the first problem which usually must be decided in laying out a new plant is the type of furnace that will be employed. Steel castings are made in crucibles, in small Bessemer converters of special design and in basic and acid open-hearth furnaces. Only high grade tool steel or special steels are melted in crucibles and shops engaged in this line of work are usually small. The choice of apparatus for standard steel foundries is thus confined to converters or open-hearth furnaces.

Steel foundry converters are a modified form of those used in making Bessemer steel and are designed to produce steel at a higher temperature than the standard Bessemer converter. They are usually operated in connection with a cupola, from which the hot metal is obtained. Few steel foundries of large capacity use converters, for reasons which will be presented later.

Open-hearth furnaces for steel foundries are similar in general design to those in steelmaking plants except that the units are usually smaller. The furnace is built of refractory brick, the dimensions varying with the capacity. The hearth may be lined with silica sand or magnesite and the charge is a mixture of pig iron and steel scrap. The fuel may be either producer gas, natural gas or oil.

The converter process requires a special class of pig iron, which must be very low in sulphur and phosphorus. Steel scrap may be used, but it must also be low in sulphur and phosphorus, since these elements are not removed in the Bessemer process. The pig iron or scrap is, therefore, necessarily costly in comparison with open-hearth stock and, on account of the growing scarcity of Bessemer ores, is becoming less and less available in the market. Bessemer steel castings are, therefore, more costly than open-hearth castings. The great advantage of the Bessemer converter is that it is convenient to use, particularly in small units, and that the first cost is comparatively low. Small converter plants are so very cheap, often costing less than $5,000 for the steelmaking equipment alone, that a great many iron foundries in this country are installing them as an adjunct to their gray iron department, that they may be able to make steel castings as required. The amount of capital tied up is small and there is no great expense incurred in starting and stopping the

The layouts, shown herewith, were designed by the Whiting Foundry Equipment Co., Harvey, Ill.

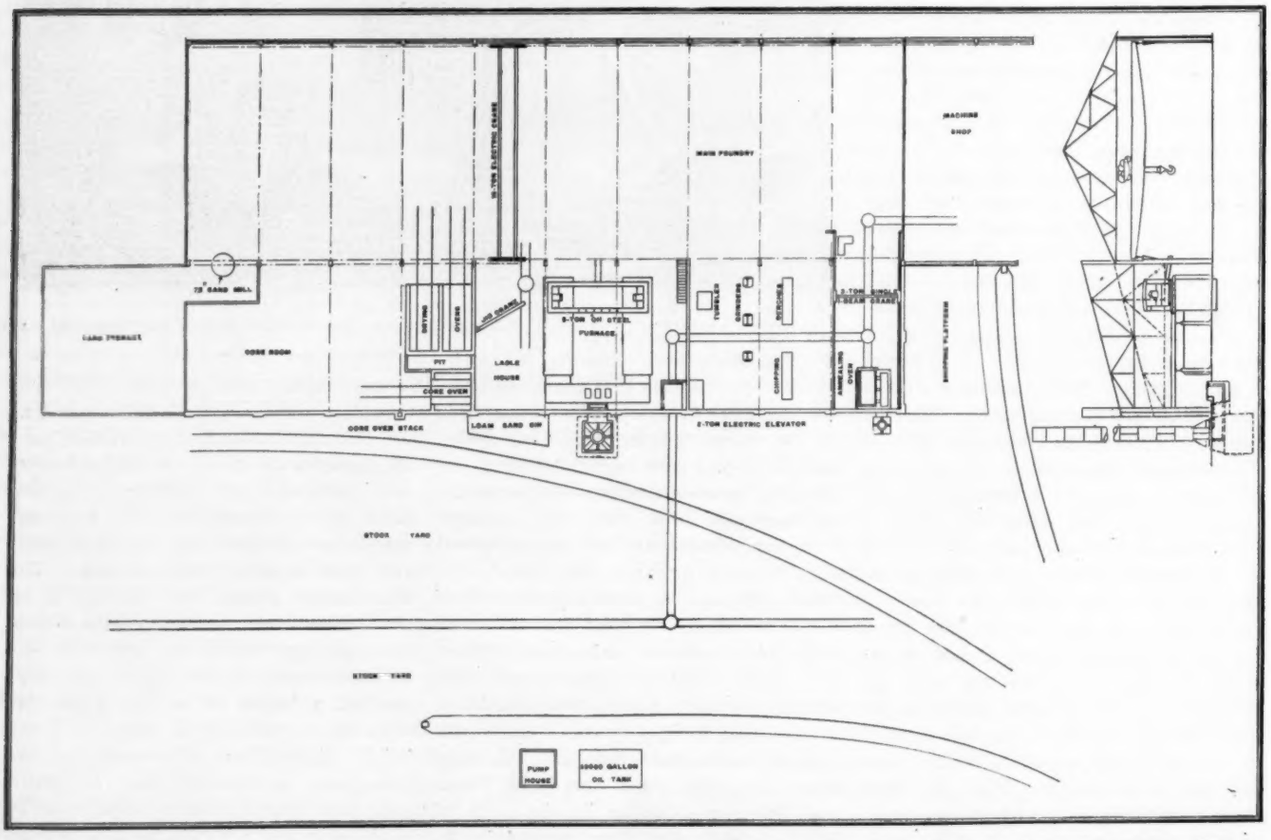


FIG. 1—GROUND PLAN AND SECTIONAL ELEVATION OF A FOUNDRY FOR THE PRODUCTION OF OPEN-HEARTH STEEL CASTINGS; DAILY CAPACITY, FIVE TONS

converter, as is the case with open-hearth furnaces. The majority of the converters used for making steel are of the Tropenas type, in which the blast enters the vessel from several tuyeres on the side and the converter is tipped in such a manner that the blast is deflected onto the top of the bath. The impurities are oxidized in the same manner as in the regular Bessemer process except that the action is not quite so rapid.

In laying out a Bessemer steel foundry it is customary to place the converter close to the cupola in order that the hot metal may be conveniently transferred to it, either by means of a spout leading directly into the converter or with the aid of a ladle and bracket crane.

The bulk of the steel castings produced in this country is made in open-hearth furnaces which may be conducted with either basic or acid hearths. The acid open-hearth process, like the converter process, requires special pig iron and scrap. The pig iron need not be as high in silicon, but is subject to the same limits in regard to sulphur and phosphorus. The basic process has a wider scope in the choice of stock, but is limited principally as to silicon. The ores from which acid pig iron are made are gradually becoming more scarce, while ores for producing basic pig iron are comparatively plentiful. The ore situation is gradually and permanently making the basic process general in steel foundries in this country. "This", as stated by Bradley Stoughton, "is in spite of the fact that basic steel has very serious disadvantages, the chief among which are the amount of oxygen it contains at the end of the process and the difficulty of adding the desired amount of silicon with the recarburizer, both of which conditions increase the liability to blow-holes, which are especially objectionable in castings, since there is no opportunity of their being welded up, and castings may have to be discarded on account of them after a good deal of machine

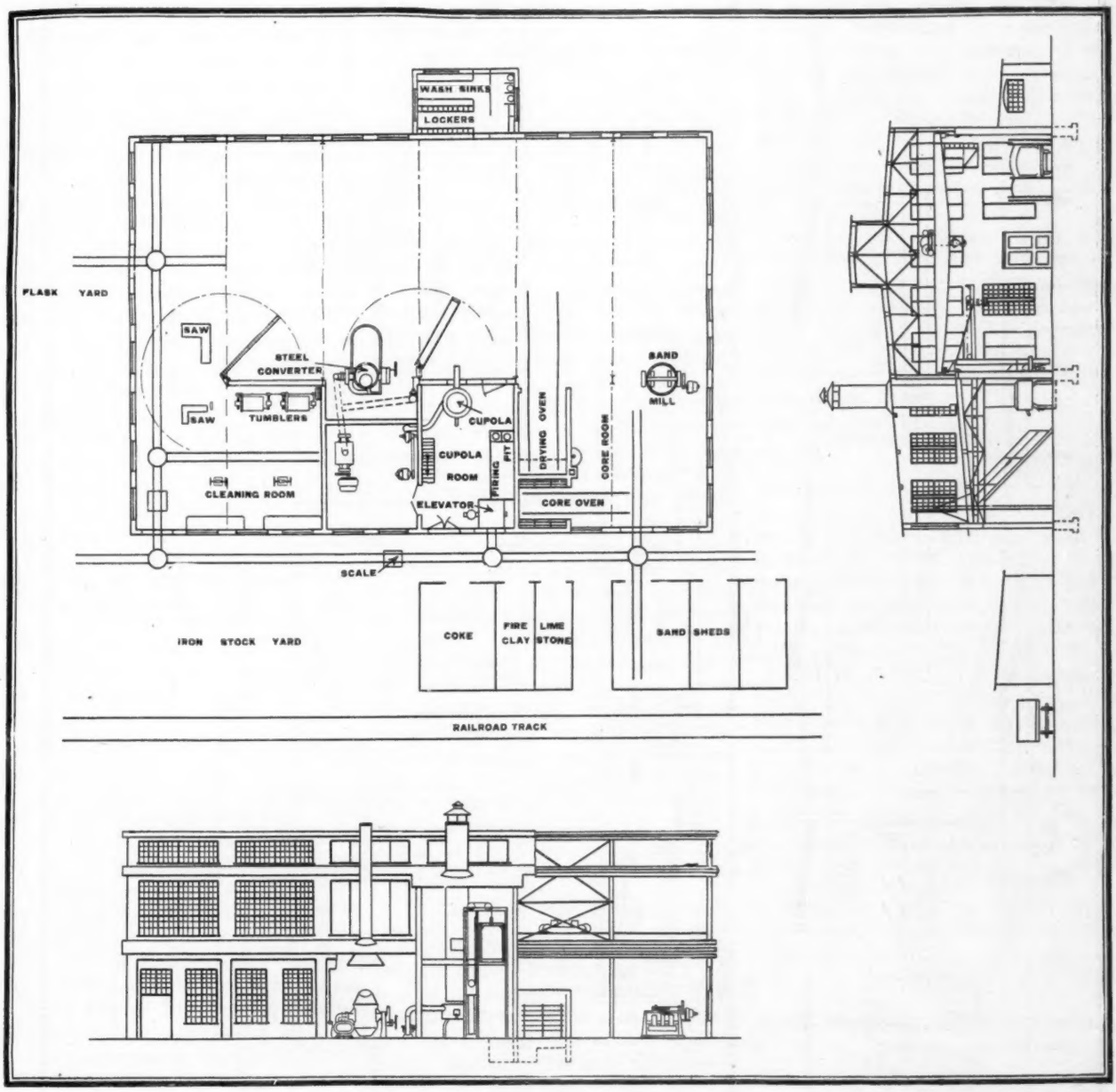


FIG. 2—GROUND PLAN, SIDE ELEVATION AND CROSS-SECTION OF A CONVERTER STEEL CASTING FOUNDRY OF EIGHT TONS DAILY CAPACITY

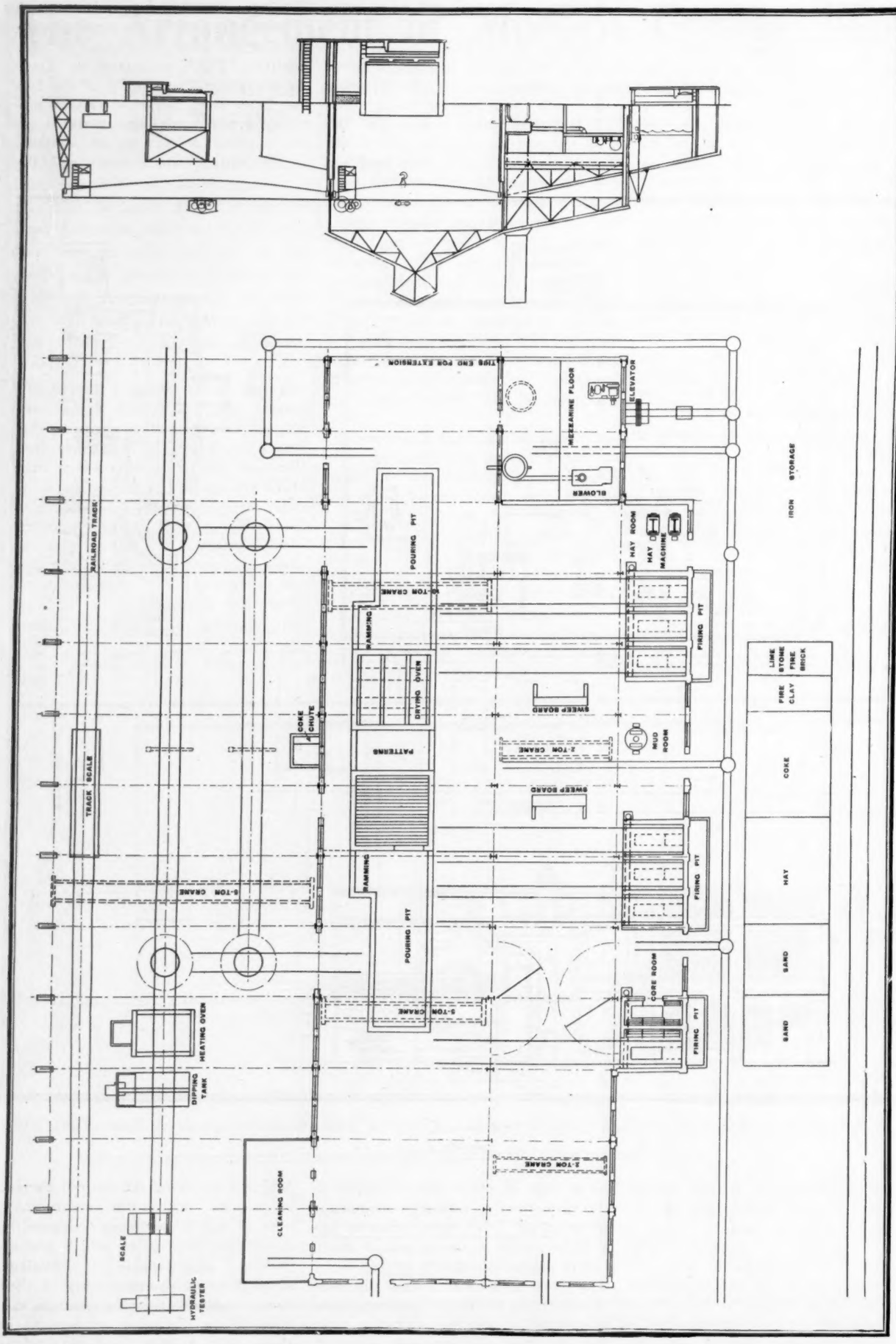


FIG. 3—GROUND PLAN AND CROSS-SECTION OF A CAST IRON PIPE FOUNDRY OF 30 TONS DAILY CAPACITY

work has been done." On this account the acid open-hearth process has long held the predominant position in the steel casting industry. In fact, this is the only place where the acid open-hearth process now finds important employment.

A Five-Ton Open-Hearth Shop.

The five-ton open-hearth steel foundry, illustrated in Fig. 1, is housed in a steel frame building, consisting of a main bay, 195 feet long and 61 feet wide, surmounted by a monitor roof, and a side bay of the same length and 40 feet wide. The main foundry has a molding floor area of 11,895 square feet. The plant is equipped with a 5-ton open-hearth furnace, centrally located in the side bay, the regenerative chambers being long and narrow and placed at either end of the furnace at right angles with the main axis of the hearth.

Three core ovens are installed in the core room at one end of the side bay. The dimensions of these ovens are as follows: Two, 18 x 8 x 6 feet, and one, 10 x 10 x 7 feet, each oven being coke-fired and provided with a car and racks.

This shop is equipped with a small annealing oven with a hearth 4 feet 6 inches wide and 10 feet long, as shown on the plan in Fig. 1. The cleaning room, situated in the side bay at the right of the furnace, is equipped with standard Whiting tumblers and three double emery grinders. Two chipping benches are also installed.

Attention is called to the ample sand storage yard at one end of the building. This yard is 40 feet square and is flanked on one side by a railroad spur. In the passage between the sand storage bins and the foundry is a 72-inch sand mill which is employed to grind and prepare the sand for molding.

The molding floor is served by a 10-ton Whiting electric traveling crane, equipped with a 5-ton auxiliary hoist, the span of the crane being 60 feet. A 3-ton jib crane is also installed in the side bay near the furnace and a 24-inch industrial railway reaches all parts of the shop and yard.

Concrete Steel Casting Foundry.

The layout of a 6 to 8-ton plant, equipped with a side,blow converter, is shown in Fig. 2. This plant is provided with a cupola 42 inches in diameter inside of lining for melting the stock preparatory to charging in the converter. The cupola is enclosed and the firing pits of the core and drying ovens are located in the cupola room. The steel converter is situated at one side of the molding floor at the left of the cupola and as shown in the illustration, the cupola and converter are served by a bracket crane having a radius of 16 feet.

The molding floor of this shop is 120 feet long and 50 feet wide. The side bay containing the cupola room, blower room, cleaning room, core ovens, etc., is 120 x 30 feet. A motor-driven sand mill is installed. The plant is provided with a large drying oven, 18 feet long, 10 feet wide and 6 feet high, and with a standard core oven, 10 x 10 x 7 feet, equipped with a car. The track from the drying oven is laid out into the molding floor so the dried molds may be handled by the main traveling crane.

Aside from the fact that this shop is fitted with a steel converter it differs very little from an ordinary gray iron foundry of eight tons capacity.

Fig. 3 shows a cast iron pipe foundry of 30 tons daily capacity. This type of foundry is very important since the amount of cast iron pipe annually produced in the United States is between 500,000 and 800,000 tons. A number of continuous systems have been devised for manufacturing cast iron pipe and one of the most modern of these was described in the January issue of THE FOUNDRY. The plant, illustrated herewith, is an ordinary cast iron pipe shop in which the work is largely done by hand. The building is 260 feet long and 85 feet wide, divided into two bays. The main bay is served by one 10-ton and one 5-ton traveling crane; each crane has a span of 50 feet and both run on the same track. The side bay is served by two 2-ton cranes, each having a span of 30 feet.

Cast Iron Pipe Foundry.

As shown in Fig. 3, the core department is equipped with mud mills and hay rope machines, since the cast iron pipe cores are formed by rolling mud on a foundation of hay wound over a core bar. The core department is provided with eight ovens, each 9 feet wide and 17 feet long. The tracks from the ovens lead to the edge of the ramming pit and the cores are placed in the molds by means of the traveling cranes.

The ramming pit is equipped with two drying ovens, which are fired by gas, each oven being 20 feet square. Between the ovens is a space, 12 x 20 feet, for storing patterns. The molds are rammed and poured at two points in the pit, as shown on the plan, Fig. 3.

The foundry yard back of the molding room is served by a 5-ton electric traveling yard crane having a span of 75 feet. One rail of the yard crane runway is supported by the wall columns of the building and the other by independent structural steel towers. The yard is provided with skidways extending in to the edge of the ramming pit, in which the finished pipes are rolled to the cleaning shed and also to the heating and dipping plant. The several skidways are connected by four turntables, as shown in Fig. 3. The foundry yard is also traversed by a railroad spur track in which are installed standard track scales for weighing shipments of pipe.

The foundry supplies and pig iron are stored in the yard back of the coremaking department, the sand, hay, coke, fire clay and limestone being cared for under cover. No provision is made for handling or storing scrap since cast iron pipe is usually made with pig iron alone.

Coating Department.

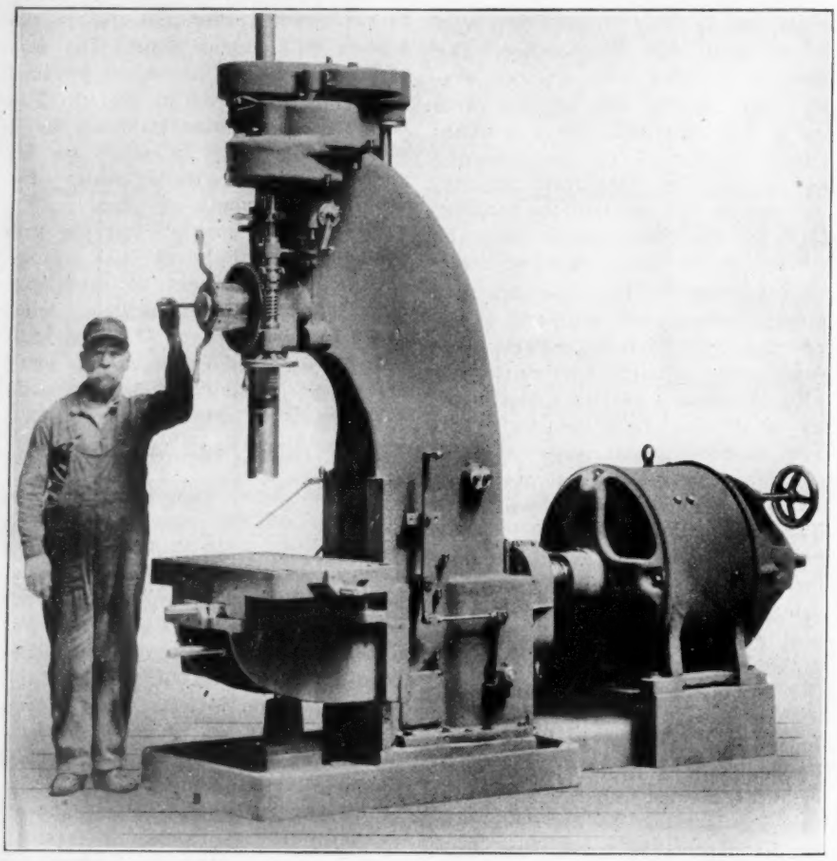
As has been suggested, the last operation on the pipe before it is tested is to coat it for protection against corrosion. The coating used is generally melted asphaltum, pitch or tar. There is also a paint made by distilling off the creosote and other volatile components of tar until the solid asphaltum is left. This is then redissolved in two of the distillates, neither of which will attack iron, and thus a paint is obtained which is said to be practically tar without any of its harmful constituents. It forms a very lasting coating which does not crack after years of exposure and it is claimed that it will not disintegrate from the action of the sun. Compressed air hoists are used in handling the pipe in the dipping tank while the tar or pitch is kept hot by a gas or coke fire.

Acid Method of Sharpening Tools

A method of sharpening files and small tools by electrolytic etching is practiced in Germany, and in one case is accomplished by cleaning the file or cutter from all grease and suspending it in a solution consisting of three parts of 66-per cent sulphuric acid and six parts of 40-per cent hydrochloric acid. A carbon electrode is suspended with the tool and the whole forms a short-circuited cell which sharpens the tool automatically.

Remarkable Drilling Tests

At the recent railway equipment exhibit held in connection with the annual meeting of the Master Car Builders' Association at Atlantic City, some exceedingly interesting drilling tests were made on a high duty drill built by the Foote-Burt Co., Cleveland, with high speed drills manufactured by the Cleveland Twist Drill Co., Cleveland. The high duty drill on which these tests were made was a standard machine, and was not especially equipped for these tests. In the accompanying table are given the drilling records. It is believed that the record of 57½ inches per minute with a 1¼-inch flat twist drill has never been exceeded.



HIGH DUTY DRILL, BUILT BY THE FOOTE-BURT CO.

The 36-inch swing high duty drill on which these tests were made, is shown in the accompanying illustration. It has a capacity for high speed drilling up to 3½ inches in solid steel. Nine changes of geared feed are provided, any one of which is instantly available without stopping the machine. The power feed is provided with adjustable automatic and hand stops. Hand feed is through worm and worm gearing, and the quick traverse of the spindle in either direction is accomplished through a spider hand wheel located at the front of the machine, which, with either the in or out movement of any and all of the handles, engages or disengages the same. The table is of the bracket knee type, and has a large square lock bearing surface on the upright to which it is securely gibbed. It is further supported and elevated by a square thread, telescopic jack screw located underneath and slightly back of the spindle. The machine is operated by a 20-horsepower, four to one variable speed motor geared direct, with a two to one reduction and back gears providing a further gear reduction of four to one and giving spindle speeds of from 37½ to 600 revolutions per minute. The distance from the center of the spindle to the face of the column is 18 inches, and the maximum distance of the nose of the spindle to the top of the table is 31½ inches. The length of the power feed is 16 inches, and the spindle speeds are from 25 to 200 revolutions per minute. The net weight of the machine is 7,000 pounds.

Drilling Records Made With a Foote-Burt 36-Inch Swing High Duty Drill.

Size and kind of drill. Inches.		Material. Inches.	R. P. M.	Feed per revolution. Inch.	Inches drilled per minute.	Periph. speed in feet per minute.	Cubic inches of metal removed.
		Cast iron.					
1¼	Flat twist	4 1/32	575	0.10	57½	163.6	70.6
1½	Flat twist	4 1/32	355	0.10	35½	139.4	62.7
1¾	Flat twist	4 1/32	350	0.10	35	160	84.18
2 1/16	Flat twist	4 1/32	190	0.05	9.5	115	39.9
3	Flat twist	4 1/32	120	0.10	12	94	84.8
		Machinery steel.					
1¼	Flat twist	4¼	350	0.03	10.5	113.7	12.8
1 5/8	Flat twist	4¼	225	0.04	9	94.8	18.6
2½	Milled	4¼	175	0.04	7	114.7	34.3
3	Flat twist	4¼	150	0.03	4.5	116	31.7
3¼	Flat twist	4¼	150	0.03	4.5	127	37.33

Reinforced Concrete Specifications

The investigation into the rusting of steel in concrete, carried on by the science committee of the Concrete Institute, led to the following conclusions: The sand, stone, cement, etc., must be thoroughly mixed and properly proportioned and must be fairly wet and well-rammed into place to minimize voids. The aggregate should pass through a ¾-inch sieve and should be as non-porous as possible. The concrete covering should never be less than ½ inch in thickness and in the case of round bars, should be as thick as the diameter of the bar. In structures exposed to water or damp air, the thickness of the concrete should be increased at least 50 per cent, and the size of the aggregate should be reduced to obtain a dense skin. The reinforcement must be completely surrounded by concrete, sufficient space being allowed between each piece and its neighbor for this purpose. All steel should be firmly supported during the ramming of the concrete to avoid displacement. Thick rust should be removed by scraping or by means of a steel wire brush, but the reinforcement must be neither oiled nor painted.

Recent changes in the executive personnel of the Pawling & Harnischfeger Co., Milwaukee, include the election of W. H. Hassenplug as vice president and of F. P. Breck as second vice president.

An Electric Furnace for Smelting Iron Ore

Description of the Experimental Plant at Trollhattan, Sweden, and the Results of the First Six Months' Operations

At the recent meeting of the Jernkontoret (the Swedish Association of Iron Manufacturers) held at Stockholm, Sweden, the engineers in charge of the electric iron smelting plant at Trollhattan, submitted their first report in regard to the construction of this furnace and the results of the first six months' operations. The British, United States, Mexican and other rights for the process have been acquired by Electro-Metals Ltd., London, Eng. The following is an abstract of the report made by the engineers, J. A. Leffler and E. Odelberg:

The experiments at Domnarfvet (Sweden's largest iron and steel works) had given most remarkable results, both technically and financially, yet further installations by private concerns were delayed until production on a larger scale could be undertaken. The Jernkontoret, therefore, representing the Swedish iron industry, deemed it expedient to take up the problem in order to bring about a definite solution with as little loss of time as possible. The electric smelting furnace at Trollhattan is really an experimental furnace, built and operated to ascertain accurately, both the financial and metallurgical value of the process. Some of the most essential points to determine were the most convenient type and method of construction and the most suitable height and dimensions for such furnaces under varying conditions and with different charges; how the electrodes should be formed and arranged; how much charcoal and what energy would be required per ton of iron; the importance of the gas circulation in relation to the economy of the system, and the possibility of manufacturing iron of varying composition; what relation the richness of the charges of either concentrate or loose ore might bear to the metallurgical results; the value of the gases, efficiency of the furnace and maintenance cost.

The furnace was erected on a site placed at the disposal of the Jernkontoret on some state property. Fig. 1 shows a vertical section through the furnace and cast house; Fig. 2 illustrates the position of the electrodes, and Fig. 3 is a horizontal section at the crucible level through the electrodes, showing their arrangement.

The dimensions of the furnace house are 78 feet, 8 inches x 50 feet, 10 inches, the height to the floor at the furnace top is 44 feet, 11 inches, and the total height 69 feet. The furnace consists of two distinct parts, the shaft and the crucible The outside of the shaft is formed of a riveted plate casing varying in thickness from 0.39 to 0.47 inches. An octagonal supporting ring of U-beams is riveted to the top of the casing, *A*, Figs. 1 and 2, by means of which it is suspended from two built-up girders which are supported on four pillars formed by the walls on either side of the furnace. These girders and their means of support are shown at *B*, Fig. 1. The girders are 51 inches high and extend 29 feet, 6 inches above the ground. Around the furnace they form an octagon, on which rests the supporting ring of the stack. The lining of the stack is from 14 to 17 inches in thickness. The top of the furnace is closed by a Tholander charging bell, which can be raised or lowered by a winch operated by a 2.5 horsepower, three-phase motor. The crucible rests upon a foundation of concrete and, like the shaft, is formed of a casing of riveted plates, 0.59 inches in thickness. The upper part of the crucible is strengthened by an iron band to support the pressure of the arched top, as shown at *C*, Fig. 1. The bottom of the crucible is formed of a double layer of fire brick, stopped up from the center to form the bowl-shaped bottom, which is faced with a layer of magnesite brick, the whole being then covered with a layer of magnesite and pitch, which is continued some distance up the walls. These latter are 17.7 inches in thickness and are formed of a double row of fire brick. The arch is bricked-up of special tiles and a sand seal makes the joint between the arch and the shaft.

The four electrodes project at an angle of 65 degrees, as shown at *B*, Fig. 2, and are made of four square carbons of an aggregate section of 26 x 26 inches. Level with the arch, the electrodes are surrounded by copper cooling jackets. The electrodes can be raised or lowered and electrical connection is made at their upper ends by means of an annular frame of cast steel. The gas produced in the furnace

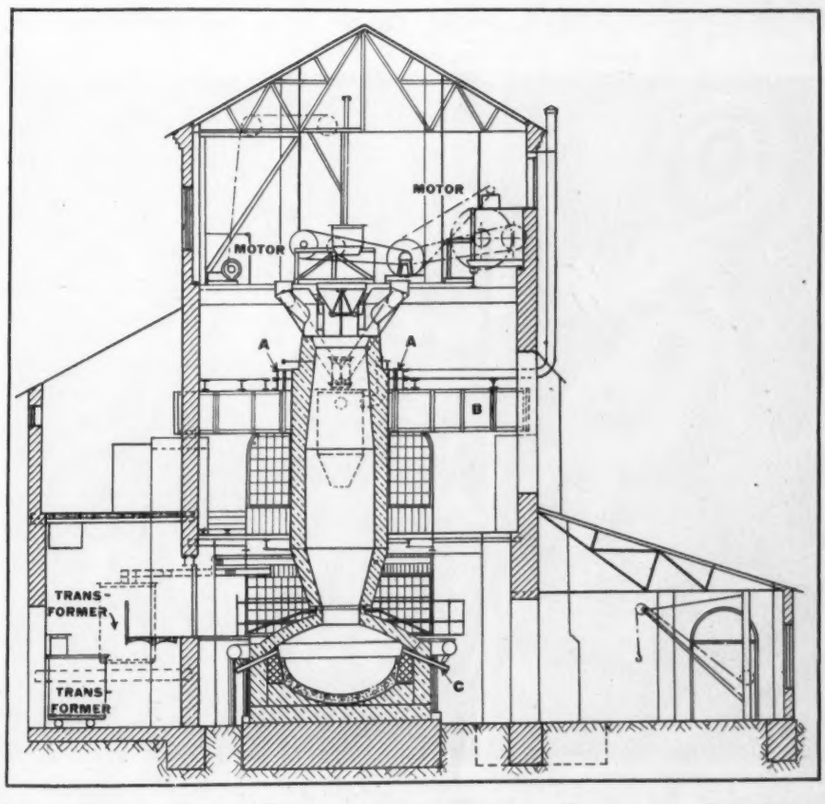


FIG. 1—VERTICAL SECTION THROUGH THE ELECTRIC IRON FURNACE AND CAST HOUSE

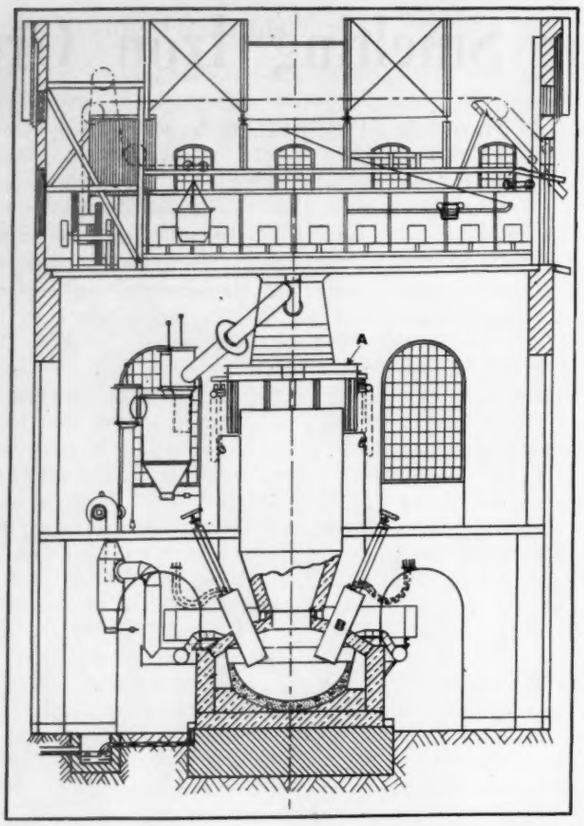


FIG. 2—SECTIONAL VIEW OF THE FURNACE, SHOWING THE POSITION OF THE ELECTRODES

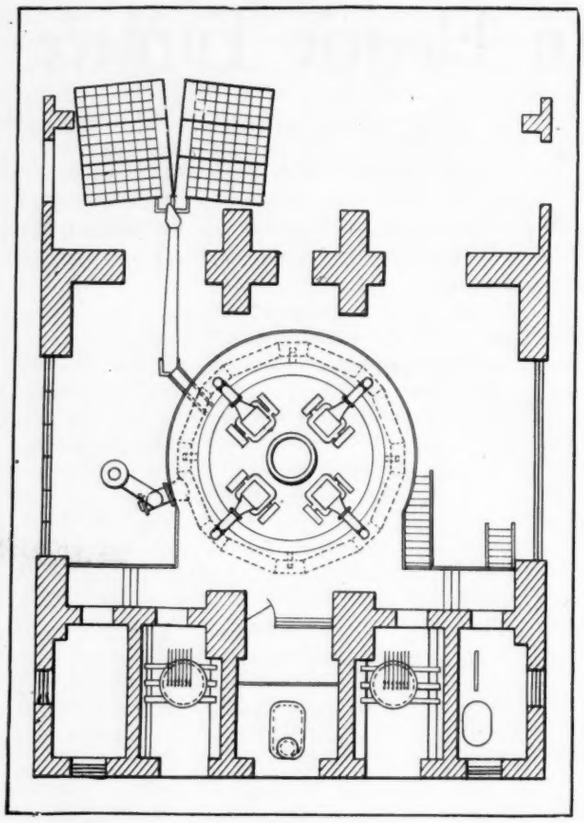


FIG. 3—HORIZONTAL SECTION OF THE FURNACE AT THE CRUCIBLE LEVEL, SHOWING THE ELECTRODES

is circulated by means of a centrifugal fan from the top of the furnace to the crucible, and the quantity can be regulated by varying the speed of the fan. The gas delivered back into the crucible is heated, and passing upward, gives up its heat to the charge. This increase in the temperature in the shaft facilitates the reduction of the ore. The gas has also a cooling effect upon the arch, thus protecting it from destructive influences.

The arrangement of the gas pipes is shown in Fig. 2. From the top of the furnace the gas is passed through a dust collector of large capacity, from which it is drawn by the fan, which forces it into an annular pipe around the furnace, and finally passes into the open space between the charge and the arch. The electric energy is obtained from the state hydro-electric power station at Trollhattan in the form of a three-phase alternating current at 10,000 volts. There are two transformers, each of 1,000-kilovolt-amperes with overload capacity They are coupled to the 10,000-volt three-phase system and yield a two-phase current with a voltage adjustable between 50 and 80 volts in eight stages, and by change of connection on the secondary side also from 100 to 180 volts.

FIG. 4—ONE OF THE NEW ELECTRODES

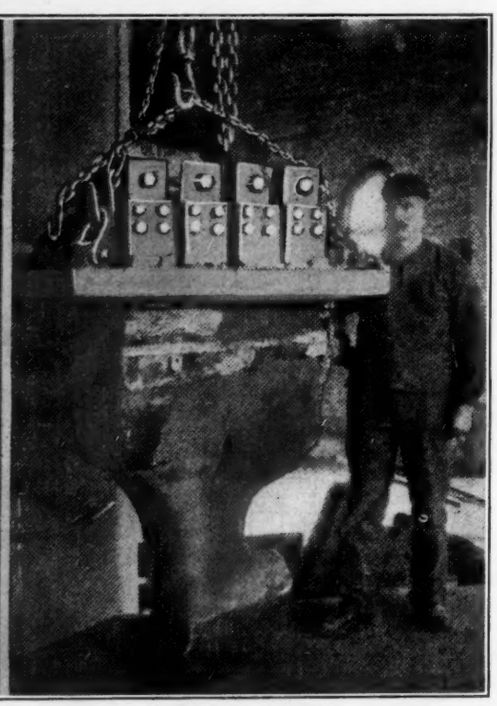


FIG. 5—ONE OF THE WORN ELECTRODES

Application of Electricity.

The transformers are oil-insulated and water-cooled, and each is placed in its own brickwork compartment, entirely separate from the furnace house. The low voltage leads from the transformers consist of six copper bars, 0.3 x 7.8 inches per electrode. The lines have been carried as far as possible, interlaced to reduce the inductive loss. The current is led

from the bars to the electrodes through 192 flexible, bare copper cables, 48 to each electrode, each cable having an area of 0.28 square inches. A separate, three-phase transformer furnishes power for lighting purposes and for one 40-horsepower motor for the crushing plant, and for five other motors ranging from 2.5 to 22-horsepower. The ore is conveyed from the crushing house to the furnace top by means of a belt conveyor and the charcoal by means of an aerial ropeway.

Design and Construction of the Furnace.

The Trollhattan electrical iron ore smelting furnace is constructed in accordance with the patents owned by the Elektro-Metals, Ltd. The principles underlying the operation of the furnace are as follows:

1.—Inasmuch as all known substances become good conductors of electric current at a high temperature, the construction of a furnace of this kind should be such that the current does not flow out through the brickwork lining, which naturally becomes conductive during operation.

2.—The construction also should be such that the charge protects the brickwork from any destructive effect, and that no water-cooling, which means a consumption of electric energy, should be necessary.

3.—The charge should not be pressed more compactly against the electrodes than is necessary for the formation of an arc. Where this condition is not complied with the working voltage is exceedingly low and the electrodes and current leads must be of large proportions and operations are irregular.

4.—In order to obtain a product of uniform quality, the furnace requires a smelting chamber, or hearth, of sufficiently large dimensions to enable it to act also as a mixer, otherwise any irregularities in the making up of the charges will re-act upon the elements, carbon, etc., contained in the finished product.

Crucible or Smelting Chamber.

To comply with these conditions the smelting chamber has been constructed in the form of a relatively large crucible with an arched roof. When the charge sinks from the shaft into the smelting chamber, it spreads in such a way that there is always space between the charge and the brickwork of the arch. The electrodes are introduced into the smelting chamber through the brickwork, at points which are not in contact with the charge, and dip into the bath at the open space referred to.

Another important question in connection with a furnace of this type has reference to the transmission of the energy to the bath and its regulation. In electric furnaces for steel manufacture, this is done by raising or lowering the electrodes, but as an iron ore smelting furnace must work with a considerably higher gas pressure, this method could hardly be adopted. The electrodes are, as a rule, only adjusted to make up for their decrease in length by combustion and otherwise, all regulation is accomplished by altering the voltage when required. This is done by regulating the number of turns on the high-tension side of the transformers and the arrangements are such that the different phases can work at the same time with different pressures, for instance, 80 volts on one phase, with 70 volts on the other, etc. This method of regulation, which has for the first time been used at Trollhattan, has, to a great extent, facilitated operation.

Proportions of the Furnace.

The section and dimensions of the furnace were calculated on the basis of a production of 7,500 tons of pig iron per year of 11 months, or about 23 tons every 24 hours. The following furnished the data for these dimensions: One cubic meter of charcoal weighs 150 kilograms (9.3 pounds per cubic foot); three kilograms of iron are obtained per kilogram of charcoal; for one ton of iron, 1.725 tons of ore are required, that is, 5.175 tons of ore per ton of charcoal; one-half the quantity of ore filters down through the charcoal, the other half of the charge requiring extra space. The specific gravity of the iron ore is 2.5 and the ratio of volume of charge per day to volume of shaft equals 1.55. From this it will be seen that the production of 23 tons of pig iron requires a volume of 51.1 cubic metres (1,800 cubic feet), the interstices in which will contain one-half the ore, or 7.9 cubic metres. By adding to this the other one-half of the proportion of ore an aggregate of 2,080 cubic feet is obtained. When divided by the ratio 1.55 the volume of the furnace is obtained, which is 1,342 cubic feet. This space is sub-divided as follows:

	Cubic feet.
The crucible or smelting chamber....	440
The neck between the crucible and boshes	16
The boshes	123
The body	417
The throat	346
	1,342

The first dimension decided upon was the diameter of the neck, which was fixed at 47.25 inches. Had it been made larger the inside diameter of the smelting chamber would have had to be increased and this would have resulted in difficulties in the location of the electrodes. The depth of the smelting chamber was arrived at on the basis of the experience gained at Domnarfvet and its bottom and sides were given a suitable shape. The dimensions of the body were made to correspond with the diameter of the neck. The shaft was built sufficiently high to obtain the best possible effect from the ascending gases in regard to the heating and partial reduction of the charge. Its height was 41 feet 8 inches from the bottom of the smelting chamber to the floor at the furnace mouth.

The furnace was started with a small quantity of coke, apart from which charcoal was exclusively used in the reduction. The charges were made according to volume, 22 cubic feet at a time, but the charcoal was always weighed and an analysis was made each day, the average being as follows: Moisture, 14.58 per cent; gas, 10.26 per cent; ash, 3.06 per cent; carbon, 72.10 per cent. The iron ore and limestone are crushed to nut size and the electrodes are built-up of four carbons, each of which is coated on its adjoining sides with a thick mixture of molasses and graphite so as to make the connection as close as possible. For protection against the air, the upper portion of the electrodes is wrapped with asbestos board and sheet iron, the top layer being covered with a thick layer of asbestos and water glass. In Fig. 4 is shown a new electrode and in Fig. 5 an electrode is shown after having been in service. A number of different charges were used during the first six months operations, but they can be classified into four groups, namely, Tuolluvaara or Lapland iron ore, roasted Tuolluvaara, and Borgvik and Uddeholm ores. The first 255 charges consisted largely of unroasted Tuolluvaara ore, and the percentage of the iron output to the ore charge was 65.57. The fuel consumption per ton of 1,000 kilograms of iron produced was 415 kilograms. The total current consumption reached 2,651,029 kilowatt-hours, and the total electrode consumption amounted to a little over 590 pounds. The arch withstood the test most satisfactorily. At first it had been feared this would prove to be a weak point in the furnace, but, although repairs were necessary from time to time, they were of minor importance.

The question as to whether the electrical process is likely to find regular and extensive application in the manufacture of a given class of iron, is one which the experimental operations cannot yet be said to have solved.

Compared with ordinary blast furnace practice, this process has the drawback of having no available means, corresponding to the action of the blast, for regulating the furnace operations. As neither oxygen nor carbon are introduced into the furnace apart from what is contained in the material forming the charge and that which proceeds from the electrodes, the results of the process are, to a large extent, dependent upon the proportion between the amounts of oxygen and carbon which are in this way introduced. These are unknown quantities, owing to variations in the composition of the fuel and the smelting material. If a variation in the operations becomes so urgent that rapid action is deemed necessary, charcoal can be thrown into the crucible through the arch, and ore also can be introduced. If there is less need for quick action, the additions for varying the operations are made through the furnace top. These means of regulation, and especially the additions made under the arch, always have a disturbing effect upon the working of the furnace. The additions introduced in the furnace top only take effect some considerable time after they are made.

Difficulty With Gas Circulation.

Another factor, the gas circulation, also has a tendency to complicate operations. The difficulty of establishing uniform gas circulation has not yet been overcome. It was, however, soon discovered that the carbon dioxide content in the outflowing gas was closely dependent upon the thoroughness of the gas circulation, and there are many causes that impede it, such as for instance, a greater or less choking-up by charcoal or ore, or the presence of dust in the pipes. A satisfactory feature is that no essential fault can be found with the height and dimensions of the furnace generally, as these have been found to meet all normal requirements of the charcoal and ore. The furnace is unfavorably affected, the same as any other furnace, by such troubles as a tendency to cake, on the part of charcoal or ore, or by too much moisture in either charcoal or charge. Under such conditions the section adopted for the furnace may not be found to be ideal, as it is necessary to maintain a powerful gas circulation. Otherwise, the moisture in the charge leads to a decrease in temperature, the reducing action of the carbon monoxide decreases, and the percentage of carbon dioxide in the outflowing gas also decreases. But this percentage of dioxide is well known to constitute an indication of the degree in which the reducing medium is being utilized, and thereby, of the economy of the process. The percentage of this gas must of necessity be kept high. A shaft having a wider neck would constitute an advantage from this point of view, inasmuch as the rise of the gases would be facilitated, thus counteracting the fall in temperature. Perhaps a lower stack and a greater diameter of body might be advisable.

To facilitate the gas circulation, the gas must be washed and the smelting chamber must be as airtight as possible to permit the fan to work to good advantage. The gas circulation, essential as it is for the protection of the arch, is attended with the drawback that the carbonic acid gas attacks the electrodes, wearing them as shown in Fig. 5. The electrically-reduced pig iron, from the information so far obtained, seems to be most suitable for use in steel-making. The furnace, however, has not been operated sufficiently long to allow of final or very complete tests to be made.

The cost of the furnace was greater than originally estimated, because of various alterations made, and amounted to $88,500. The furnace is managed by a commission appointed by the Jernkontoret, and comprises five well known scientists. J. A. Leffler, an engineer, acts as managing director, and he is assisted by two other engineers. Two engineers also, are engaged in the chemical laboratory, and two act alternately for taking records.

New Catalogs

ELECTRIC INTERURBAN LOCOMOTIVES.—The General Electric Co., Schenectady, N. Y., in a recent bulletin, describes and illustrates its standard 50-ton electric locomotive. These locomotives are recommended for service on electric interurban roads.

FRICTION CLUTCH.—The Dodge solid friction clutch is described in an 18-page pamphlet and price list, issued by the Dodge Mfg. Co., Mishawaka, Ind. These clutches are made in a range of sizes that will transmit from two to 50 horsepower at 100 revolutions per minute and proportionately more at higher speeds.

BRASS PRODUCTS.—The Michigan Copper & Brass Co., Detroit, has issued a 42-page price list of its extensive line of brass products in sheets and rolls, rods, wire and tubing, as well as low brass, bronze and copper in the form of sheets and rolls. Tables of weights of sheet copper, drawn copper bars, yellow or Muntz metal, pure copper wire, etc., are included.

ALTERNATING CURRENT SWITCHBOARD PANELS.—A bulletin, describing and illustrating its line of alternating current switchboard panels, has just been issued by the General Electric Co., Schenectady, N. Y. It contains considerable information designed to aid prospective customers in selecting switchboard panels best suited to their needs.

MAZDA LAMPS.—The General Electric Co., Schenectady, N. Y., has issued a bulletin describing its Mazda lamps. These lamps are now equipped with drawn wire tungsten filaments in place of the pressed tungsten filaments formerly used. The latter were inclined to be delicate and it is claimed that the new filaments are many times stronger at all periods during life.

COUPLINGS.—The General Electric Co., Schenectady, N. Y., has issued a bulletin describing its line of flange and flexible couplings. These couplings are especially adapted for coupling electrical apparatus, and joining such apparatus to other machinery. They include leather link flexible couplings, laced belt flexible couplings, mill type flexible couplings, rubber buffer flexible couplings and flange couplings.

ELECTRICAL INDUSTRIAL LOCOMOTIVES.—In a recent bulletin, the General Electric Co., Schenectady, N. Y., describes and illustrates its line of electric locomotives for industrial railways. These locomotives are built for both standard and narrow gage tracks and in various styles. The bulletin contains an information sheet which may be filled out by prospective users of this type of locomotive.

TURRET LATHES.—The New Britain Machine Co., New Britain, Conn., which recently took over the plant, patents and good will of George G. Prentice & Co., Inc., New Haven, Conn., announces that it will continue to manufacture the multiple spindle automatic turret machines formerly made by the latter company. In a circular just issued, the New Britain Machine Co. includes a table showing the various dimensions and capacities of these machines.

STEAM TURBINE GENERATORS. — A bulletin issued by the General Electric Co., Schenectady, N. Y., is devoted to that company's Curtis horizontal steam turbine generator. This turbine ranges in capacity from 100 to 1,000 kilowatts at 3,600 revolutions per minute, the maximum speed possible with 60 cycle, alternating current generators. These units are particularly adapted to industrial and lighting plants requiring the economical generation of a moderate amount of power. The bulletin contains illustrations of installations of these turbines. A number of line cuts explain the construction of the unit.

STEWART STRUCTURES.—A very handsome book, 8 x 11 inches, 204 pages, entitled "Some Stewart Structures," has just been issued by James Stewart & Co., contractors, with offices in New York, St. Louis, Chicago, Pittsburg and other cities. Founded in Canada in 1845, this company presents the unusual spectacle of a contracting firm having had an uninterrupted existence of more than 50 years under the same name and ownership. The volume just issued is a record of the company's achievements during the past ten years, in which period it has carried on extensive operations in Canada and Europe, as well as in the United States. The book is divided into three general sections: Office buildings, hotels and public buildings; industrial works, power developments and heavy masonry construction; wharves, docks, grain elevators, etc. Each section is accompanied by a large number of illustrations showing the various structures in process of erection. No efforts have been spared in the preparation of this volume and the work is an encyclopedia of the progress in building and general construction during the past decade.

Prices on the New York stock exchange moved in a narrow range last week and trading was at a low ebb. The crop situation gave less concern, a break in the drought being reported from the western agricultural belt.

Stocks opened strong and higher on Monday but turned weak; grain markets declined; the Steel Corporation reported an increase in tonnage of unfilled orders on books. On Tuesday, stocks opened strong but ruled dull and averaged higher at the close; out of $9,750,000 worth of 4 per cent bonds offered for sale by the city of Philadelphia, only $3,534,000 were allotted, because of unsatisfactory prices; English consols declined to the lowest price in 80 years The market on Wednesday was again dull and sold off; corn advanced to the highest price of the movement. On Thursday, stocks were dull; the grain markets were excited and advanced to the highest prices of the movement; English consols partly recovered. On Friday, business on the exchange reached the smallest total in three years; wheat declined violently. Prices on Saturday closed at the lowest but net changes were small; July wheat was strong.

Money on call ranged from 2½ to 2 per cent. Time money was more active, the demand being broader and offerings ample. The statement of the actual condition of clearing house institutions showed loans decreased $872,000; net deposits increased $12,902,000; total reserve, $435,627,000; excess of reserve, $11,712,800, an increase of $4,335,800; and the percentage of reserve was 25.4 compared with 25.7 the previous week. Non-member banks and trust companies showed loans increased $4,483,300; net deposits increased $4,298,800; reserve on deposits decreased $690,300, and the percentage of reserve 19.4 against 19.5 the week previous. Commercial failures for the week were 233, against 176 the previous week and 247 the corresponding week last year. Bank clearings for the week showed a slight decrease from the preceding week and a decrease of 1.1 per cent from last year. The fortnightly railroad statistics showed an increase in the number of idle cars of 451, compared with a decrease of 2,800 the preceding fortnight. Shares were sold to the number of 967,050, compared with 1,065,600 the preceding week and 2,613,600 the corresponding week last year. Bonds, exclusive of government bonds, were sold to the amount of $10,094,000, compared with $9,372,000 the preceding week and $6,847,000 the corresponding week last year.

	Closing Quo. July 15	Changes in week	Annual Meeting date 1911	Stock Outstanding	Basis	Dividend Last	Dividend Div. Date	Dividend Pay Last
Allis-Chalmers	8½	— ½		$19,820,000				
Allis-Chalmers, pr	28	.....	Nov. 2	16,150,000	7 cum.	1¾ Q.	Feb.,	1904
American Can	10¾	+ ¼	Feb. 1	41,233,300		1¾ Q.		
American Can, pr	86½	+1⅜		41,233,300	7 cum.	1¾ Q.	July,	1911
Am. Car & Fdy	56½	.....	June 29	30,000,000		½ Q.	July,	1911
Am. Car & Fdy., pr	117¾	+ ¾		30,000,000	n. c.	1¾ Q.	July,	1911
American Loc	41	+ ¼	Oct. 17	25,000,000	5	1¼ Q.	Aug.,	1908
American Loc., pr	110	.....		25,000,000	7 cum.	1¾ Q.	July,	1911
American Ship	64¾	.....	Oct. 11	7,600,000	4	2 Q.**	June,	1911
American Ship, pr	111	+1		7,900,000	7 cum.	1¾ Q.	July,	1911
Am. Steel Foundries	38⅝	+1½	Dec. 7	17,184,000		1 Q.	May,	1911
Barney & Smith	20	.....	June 6	2,000,000	4	1 Q.	Dec.,	1907
Barney & Smith, pr	87	.....		2,500,000	8 cum.	2 Q.	June,	1911
Bethlehem Steel	33¼	+ ¾	April 4	14,862,000				
Bethlehem Steel, pr	62⅝	+ ½		14,908,000	7 n. c.	¾ Q.	Feb.,	1907
Cambria Steel	45¼	+ ⅜	Mar. 21	45,000,000	5	1¼ Q.	May,	1911
Cambria Iron	44	.....		8,468,000*	4	2 S. A.	Apr.,	1911
Chicago Pneumatic Tool	51	— ¼	Feb. 20	6,485,800	4	1 Q.	July,	1911
Colorado Fuel	35	+ ¾	Oct. 16	34,235,500		1¾ Q.	Apr.,	1902
Crucible Steel	12¾	.....	Oct. 18	24,578,400		3½		
Crucible Steel, pr	82	+ ¼		24,463,500	7 cum.	1¾ Q.	June,	1911
Empire Steel	5	.....	Feb. 22	1,254,770				
Empire Steel, pr	50	.....		2,500,000	6 cum.	1 S. A.	July,	1911
Fay & Egan	70	.....	Feb. 21	1,000,000	6 cum.	3 S. A.	Feb.,	1911
Fay & Egan, pr	110	.....		1,000,000	7 cum.	1¾ Q.	Feb.,	1911
General Electric	161¾	—1¾	May 9	65,179,600	8	2 Q.	July,	1911
Harbison-Walker	45	.....	Jan. 16	18,000,000		½ Q.	June,	1911
Harbison-Walker, pr	98	.....		9,600,000	6 cum.	1½ Q.	July,	1911
International Pump	41¾	.....	Dec. 12	17,762,500		1 Q.	Nov.,	1910
International Pump, pr	89¼	— ¼		11,350,000	6 cum.	1½ Q.	Aug.,	1911
Lackawanna Steel	42	.....	Mar. 8	34,978,000				
Lake Sup. Corp	26⅝	+ ⅛	Oct. 4	40,000,000				
New York Air Brake	75	.....	Mar. 8	10,000,000	6	1½ Q.	July,	1911
Niles-Bement-Pond	94	.....	Feb. 8	8,500,000	6	1½ Q.	June,	1911
Niles-Bement-Pond, pr	104	.....		2,000,000	6 cum	1½ Q.	May,	1911
Otis Elevator Co	72	.....	Mar. 20	6,375,000	1	1 Q.	July,	1911
Otis Elevator Co., pr	102	—1		6,310,000	6 n. c.	1½ Q.	July,	1911
Pa. Steel	60	.....	May 8	10,750,000				
Pa. Steel, pr	106½	.....		16,500,000	7 n. c.	3½ S. A.	May,	1911
Pittsburg Coal Co	20¼	+ ½	Feb. 10	28,104,600				
Pittsburg Coal Co., pr	82¾	.....		27,071,800	7 cum.	1¾ Q.	July,	1911
Pressed Steel Car	36	.....	Feb. 15	12,500,000		1 Q.	Aug.,	1904
Pressed Steel Car, pr	102	.....		12,500,000	7 n. c.	1¾ Q.	May,	1911
Pullman	160¾	—1¼	Nov. 8	120,000,000	8	2 Q.	May,	1911
Railway Stl. Spring	36¼	+ ¼	Mar. 2	13,500,000	2	1 S. A.	Oct.,	1908
Railway Stl. Spring, pr	101¼	.....		13,500,000	7 cum	1¾ Q.	June,	1911
Rep. Iron & Steel	29¾	— ¼	Oct. 18	27,191,000				
Rep. Iron & Steel, pr	93¾	.....		25,000,000	7 cum.	1¾ Q.	July,	1911
Sloss-Sheffield	48⅞	+ ¾	Mar. 15	10,000,000	5	1¼ Q.	Sept.,	1910
Sloss-Sheffield, pr	112	.....		6,700,000	7 n. c.	1¾ Q.	July,	1911
U. S. Pipe & Fdy. Co	16	.....	June 28	12,106,300		1 Q.	Dec.,	1910
U. S. Pipe & Fdy Co., pr	55⅞	—1⅝		12,106,300	2	1¼ Q.	June,	1911
U. S. Steel	79	+ ¼	April 17	508,302,500	5	1¼ Q.	June,	1911
U. S. Steel, pr	118½	+ ⅛		360,281,100	7 cum.	1¾ Q.	May,	1911
U. S. Steel 5s	105¾	— ⅛		463,798,000	5			
Va. Iron, Coal & Coke	87	—2	Sept. 19	9,073,680		5. †	Oct.,	1907
Westinghouse Electric	75⅛	— ⅞	July 26	3,998,700*		1¾ Q.	July,	1911
Westinghouse Air Brake	148¼	— ½	Oct. 3	13,750,000*		5 Q. ‡	July,	1911

Par value of shares, $100, except those starred (*), $50.
**Includes last 1 per cent payment of 4 per cent extra.
†Stock.
‡Includes 2½ regular, 1½ extra and 1 special

Copper Stocks.

New York. — Amalgamated Copper closed 68¾, a net loss of ¾.

Boston.—Butte Coalition closed 18¼, a net loss of ⅞; Calumet & Arizona closed 58½, a net gain of ½; Calumet & Hecla closed 451, a net loss of 24; North Butte Mining closed 37½, a net loss of 1; Quincy Mining closed 73½, no change.

Four hundred workmen of the American Smelting & Refining Co., at Monterey, Ala., who struck on July 1 for higher wages, have returned to work.

The Bay View Foundry Co., Sandusky, O., has increased its capital stock from $40,000 to $75,000.

THE IRON TRADE REVIEW

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THE AVERAGE PAID CIRCULATION OF THE IRON TRADE REVIEW FOR THE ISSUES OF THE FOLLOWING MONTHS WAS:

May, 1910	5,827
May	5,827
June	5,842
July	5,864
August	5,875
September	5,895
October	5,955
November	5,993
December	6,026
January, 1911	6,058
February	6,072
March	6,091
April	6.108
May	6.112
June	6,124

July 20, 1911

Relation of Floor Space to Plant Capacity

In order that a plant may turn out its product at the high speed demanded by modern conditions, it is not only necessary to have the most up-to-date machinery of the greatest possible capacity, but it is also essential to provide highly perfected apparatus for the transportation of material within the plant and to allow plenty of space for handling goods in the process of manufacture.

These two points are often overlooked by designers in re-equipping old plants or laying out new ones. In many cases, machine shop managers have been induced to throw out their old machine tools and install modern high speed tools in their place, thinking that thereby they would greatly increase the output of their plants. The actual net increase obtained, however, has often been disappointing and it has been frequently found upon investigation that there was not sufficient floor space in the old shop to handle the greatly increased volume of material which accumulates when the rate of production is sharply increased.

A particularly good example of the intimate relation between the capacity of a plant and the floor space available for handling materials in the process of manufacture, is found in the experience of the American Bridge Co. at its Ambridge works. Not long after the plant was built, it was discovered that when operating at a leisurely rate there was no congestion and no difficulty in handling material through the shop, but, when the production was pushed, there was such an accumulation of partly fabricated material between the punching and shearing and the assembling and riveting departments as to seriously interfere with the operations of the shop. This could not be obviated by redesigning the equipment because it is physically impossible to adjust the punching and shearing and the assembling and riveting departments of any fabricating plant to exactly the same capacity on all kinds of work. Most fabricating shops like the Ambridge plant, have punching and shearing capacity somewhat in excess of their riveting and assembling ability when handling certain kinds of work, with the result that there is an accumulation of partly worked material between the two departments, for which, in the case of the plant mentioned, there was not sufficient storage space available.

This lack of absolute harmony between the capacity of the various units exists in every plant and makes it necessary to provide space for the storage of parts which accumulate in the process of manufacture, but in the case of modern equipment running at high speed, considerable more material naturally accumulates than when the machines are of smaller capacity.

The experience of the American Bridge Co. at its Ambridge plant led it to provide a large connecting bay in its new plant at Gary, which contains ample space for the storage of partly fabricated materials awaiting the riveters and assemblers.

It is not possible in many cases greatly to increase the production of an old plant by simply installing new tools. It is necessary to redesign and rearrange the entire works with the new rate of production in mind and to provide at all points sufficient space and facilities for handling the larger amount of material resulting from faster production.

Duplex Steel Making and Scrap Prices

Probably the most potent influence that has brought about the duplex method of steel making, especially in the eastern district, has been the desire of the manufacturers to avoid the uncertainties and price fluctuations of the heavy melting steel market. In active trade times when their melt under the customary ratio of one-half scrap and one-half pig iron in open-hearth practice has reached large proportions these makers have experienced much difficulty in not only locating sufficient quantities of first grade melting stock but also in obtaining their requirements without subjecting themselves to a market of sharply advancing prices. Other important reasons have entered into the adoption of the duplex method, including the improved use for steel making of resources of low grade ores and the utilization of Bessemer plants which otherwise might be rendered of little value by the broadened demand for open-hearth products.

The growing scarcity of heavy melting steel is common not only to the eastern district, but in all territories where open-hearth steel making operations are conducted on a large scale. Because of the increasing adop-

tion of the open-hearth steel process, primarily designed as a scrap consuming process at the expense of Bessemer steel making, the scrap producing process, the question seems to be simply one of insufficient scrap production.

In the duplex method, the importance of the scrap factor is minimized. Under perfect conditions, no scrap at all is used, and such is the case in much of the actual practice now being conducted in the east and other sections. By the combination of the Bessemer converter and the open-hearth furnace in the duplex process the pig iron is first desiliconized and then dephosphorized. This makes the selection of materials less exacting than in the use of both scrap and pig iron in the regular open-hearth process and it gives the steel maker a wider latitude in his operations.

In view of the more independent position of some of the leading eastern scrap consumers, notably the Bethlehem Steel Co., the Pennsylvania Steel Co. and the Maryland Steel Co. using the duplex method, and the Alan Wood Iron & Steel Co., the Worth Bros. Co. and others employing direct metal from the blast furnaces, there is a fear expressed by some scrap dealers that heavy melting steel may be kept at depressed prices in that territory. As the duplex method reduces the scrap requirements in steel making, the automatic regulation of supply and demand will undoubtedly tend to steady scrap prices and possibly prevent "runaway" conditions in this material, under a heavy, general demand. But there are conditions connected with the duplex process which interpose effective qualifications of such a rule.

Duplex steel making considered per unit of output is not a cheap method of manufacture. There is always a greater percentage of steel to be realized from a ton of steel scrap than from a ton of pig iron for the obvious reason that the former material has one or more times been through the refining process of steel-making. Theoretically, therefore, a ton of first quality steel scrap should command a higher valuation in the open market than a ton of pig iron. This is not always the case. Both materials fluctuate in their own way according to their separate production and demand. At present, heavy steel scrap costs the eastern mills about $13.25, delivered. These buyers would have difficulty in obtaining basic pig iron at $1 a ton above the price for scrap. Accordingly the cost element may be expected to exert considerable bearing upon the determination of the question whether all pig iron or the duplex method or pig iron and scrap combined or the open-hearth process, is the more profitable plan of operation.

On the other hand, the duplex method is an increased producer of steel ingots because a considerable reduction of the elapsed time of a heat is obtained by the joint use of both of the common types of steel making equipment when compared with the time factor of the ordinary open-hearth practice. There are times, of course, when the matter of tonnage is of greater importance to the steel maker than that of cost. Some of the duplex operations have illustrated this fact through their alternating in its use, employing it when heavy demands are made by consumers upon their finishing mills, making necessary an increased ingot production; and discontinuing it when the demand for finished products is only at a proportionate rate of full capacity, as has been the case for the past several years. In this way, they have availed themselves of the benefits of the low scrap market. The price level of finished products and the margin of profit it represents are also of important consideration.

Cost and tonnage are accordingly the influences finally determining to what extent the duplex and direct metal processes are used in a plant. A desire for a lower cost usually means more scrap and less pig iron; a sacrifice of the cost factor in favor of tonnage implies less scrap and more pig iron. The way in which steel makers pick their alternative under the prevailing market conditions will fix the degree in which the reduced scrap methods of steel making will affect the market for open-hearth furnace material.

ALTERNATE PLANS

Of New York Subway Construction Affect Steel Requirements.

New York, July 14.

Until the contracts are finally awarded and the contractors signify what form of construction they will follow, it will be impossible to finally state just what the total steel requirements of the proposed extensions of Greater New York's triborough subway extensions will be. The reason for this is that the city authorities leave to the successful contractors, under the accepted plans, the alternative of reinforced concrete and riveted steel construction for the different extensions and the extent to which either of these two methods is adopted by the contractor will determine the nature and amount of the steel requirements. In the event concrete re-inforcement is followed, the tonnage of steel bars will be much greater and that of structural steel much less and if the riveted steel plan is adopted, the division of the steel requirements will be reversed. It seems likely that each type of construction will be used in part owing to the physical conditions of the work at different stages. The maximum steel requirements for the proposed subway extensions are estimated at from 250,000 to 300,000 tons of plates, shapes and bars.

Will Use Girod Electric Furnace

Another well known American steel company, whose name and plans cannot be disclosed at this time, has signed a contract for license to use the Girod electric furnace. The company in question manufactures the highest grade of steel castings and other forms of steel of high quality, and like the well known German firm of Krupp & Co., the Simonds Mfg. Co., Lockport, N. Y., and the John Cockerill Co. in Belgium, and other well known European works which are using the Girod furnace, it has become convinced the the Girod furnace shall meet the rigid requirements of its trade.

The Willsea Works, Rochester, N. Y., has purchased the foundry and machine business recently conducted by the estate of J. Emory Jones, also of Rochester, and will manufacture emergency patterns and machine castings, and do forging, flue welding, tool dressing and machine work.

Judge Gary Dominates Brussels Conference,

Overcoming by His Diplomacy the Suspicions of the Englishmen — Social Features Play an Important Part — Fourth of July Celebrated

By J. Horton, Staff Correspondent

Brussels, July 5.

The real business of the conference commenced today, when the delegates from every steel-making country met at the Salle des Fêtes, Restaurant de la Monnaie. The meeting place was ideally central, close to the post office and not far from the cathedral. In honor of the visitors, a special decorated awning had been placed over the entrance and the gangway had been carpeted for the occasion. The interior of the hall looked pleasant and comfortable with its artistic wall painting. After mutual greetings, the chair was temporarily taken by Colonel Bryan, minister of the United States, who cordially welcomed the visitors on behalf of the American representatives and of the city. Then, by general consent, it was agreed that Judge Gary should occupy the chair, this proposition being put forward by Monsieur A. Greiner, of Belgium. W. B. Peat, of London, was elected secretary of the meeting.

A discussion took place as to whether the press should be admitted, but it was decided to elect a press committee, to discuss matters in private, and furnish a report to the press afterwards. It was further decided that all the proceedings should be reported by stenographers, and afterwards printed in full and given to the press if and as requested.

The following report as to the rest of the proceedings on the first day is furnished by the press committee:

The president of the meeting, Judge Gary, delivered an address, outlining the objects of the meeting, and containing recommendations relating to an international iron and steel association.

After the address, speeches were made by Sir John Randles, of England; Baron Von Bodenhausen, of Germany; Sir Hugh Bell, of England; Monsieur A. Greiner, of Belgium; Monsieur G. Trasenster, of Belgium; Monsieur A. Dreux, of France; Herr W. Kestranek, of Austria; Herr Armin von Biro, of Hungary; Count de Zubiria, of Spain; Mr. Witmeur, of Russia; T. J. Drummond, of Canada; J. A. Farrell, C. M. Schwab, Willis L. King, E. A. S. Clarke, all of America, and Herr Fritz Thyssen, of Germany.

Thereupon the following resolution was proposed by Sir. Hugh Bell, seconded by Baron von Bodenhausen, and unanimously adopted.

It was resolved that this meeting thanks his honor, Judge Gary, for his address, and approves the views therein expressed. The meeting accepts the suggestion that a committee be appointed to consider in what manner practical effect can be given to those views. Such committee to consist of not more than five representatives from each country, and to be empowered to consider the full question, and to report the result of its labors on a subsequent meeting to be convened by the committee.

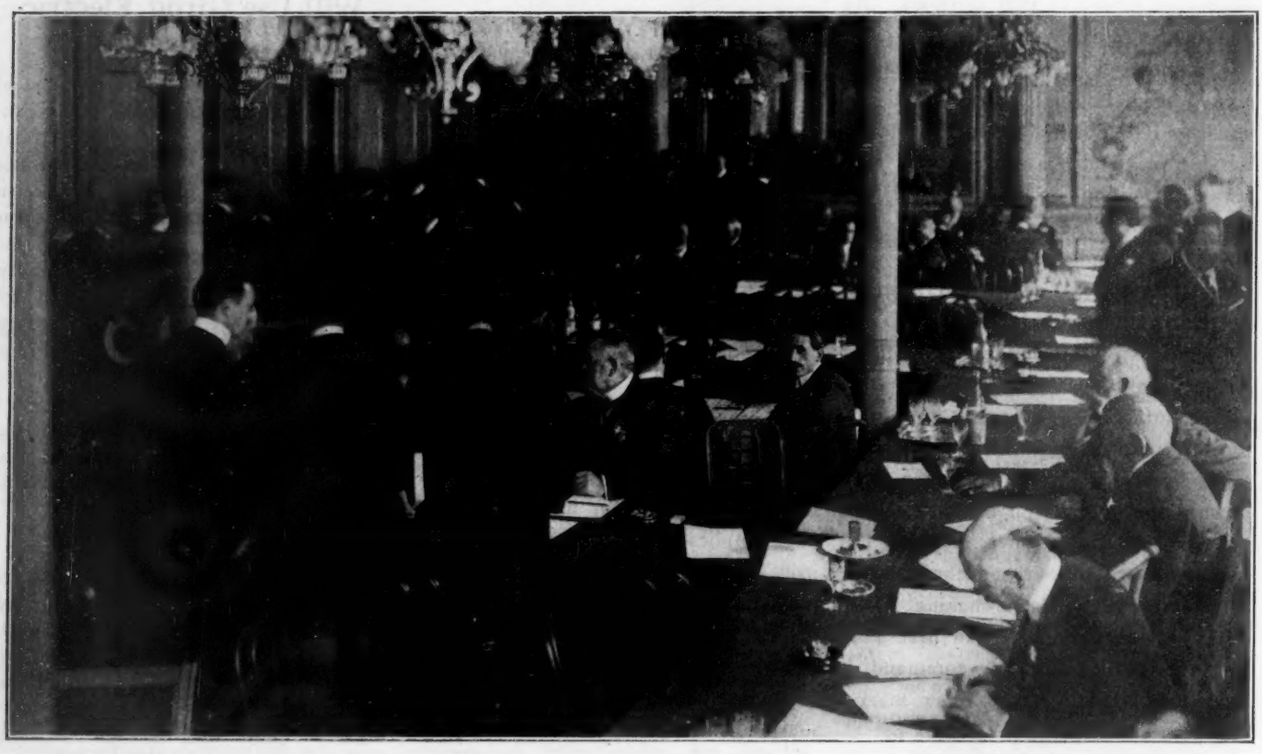
The convention then adjourned until 10 o'clock, July 6.

Judge Gary's Speech.

Judge Gary spoke in part as follows:

In the long past, to a greater or lesser extent, business has meant business, just as war has meant war, to use a common expression. We have been actuated by motives of cupidity; we have been selfish, narrow and short-sighted. Our individual rights have been paramount to those of our neighbors.

In the treatment of competitors, customers and employes, we have, in some measure at least, dealt at arm's length. Believing we were acting in self defense —often forced to the conclusion—we have been quite inclined to extend the



MEETING ROOM OF THE CONFERENCE

club rather than to offer the olive branch. And as the result of hasty conclusion, we have often been properly chargeable with injustice. To the extent we have thus governed our conduct, we have not stood on the platform of good morals or good policy. We have brought upon ourselves unnecessary difficulty, trouble and loss. For the many disagreeable conditions sometimes appearing in connection with our various and varied responsibilities (known and realized by all of us and not necessary to be referred to in detail at this time), we are partly at fault. But the world is growing better. Nations are coming to realize that arbitration is better than war; that justice is superior to power; that the settlement of any question should be based upon what is right rather than upon the strength of arms or the power of money, and that for every reason, even from the selfish view, it is to the interest of every nation to secure and maintain the most intimate and friendly relations with all other nations.

Many of those who are here will live to see the day when war is a thing of the past and when every nation will adopt the sentiment that "right makes might", when all will be disposed to "live and let live".

It has been the ambition and expressed wish of many who are present that there might be formed an international iron and steel association or an organization of some kind, which would be calculated to cement the existing fraternal relations and which might afford opportunity for the interchange of opinions and information between the iron and steel producers of the world, concerning all the questions relating to the industry—an organization distinguished from and broader in its scope and activities than the existing great and splendid institutions which have become so thoroughly established and which have potential force and influence in many directions.

Whether or not there is need for such an organization as the one now under discussion, or what would be the result, or whether or not the benefits to be derived are sufficient to justify the undertaking, are questions to be considered. It had seemed to me that if we could have a common meeting place, where the iron and steel manufacturers of the world could meet for the discussion of economical, ethical and sociological questions, it would be useful. It would appear that an institution having aims and objects like those I have suggested, might be a great influence for good. If it stood for the ideals in business and should reach a measure of success in this respect we would have cause to be gratified with the results. Certainly it would be an honor to be enrolled on the list of membership. No member would be disposed to do anything dishonorable towards another member. I believe it feasible to organize and conduct an organization which would be valuable in its results. Necessarily it should be formed and managed so as to avoid any antagonism or interference with any other institution and so as to secure the approval of public sentiment. If all of us who are considering the matter approach the subject with the proper spirit, if we are in earnest, if we are frank and unselfish, we may accomplish much. Many will see difficulties, and there would be many, especially in administration. We may determine, after full deliberation, that what is proposed is not practicable, although desirable; but is worthy of our unbiased attention.

However high and commendatory our actions and objects, we must nevertheless exercise reason and prudence, looking far ahead for the purpose of seeing, if possible, what will be the effect upon our respective interests and upon those of others. I think all will agree that it is better to go right than to go rapidly; that all the matters involved should receive great deliberation before final conclusion. If so, I would suggest that if after full discussion we decide that the question of forming an international association has merit, we should, at this meeting, appoint a committee, made up, say, of two or three from each country to consider the whole subject and report their conclusion and recommendation at a future meeting to be determined upon and called by the committee.

The morning session lasted over three hours, and it was decided that an afternoon session was unnecessary. The interval was employed by the different sections in holding meetings, the one by the English delegates at the Bellevue hotel being an especially large and important gathering. This, like all other sessions, was held in strict privacy. In the evening, there was a general dinner at the Restaurant Royale rue d'Aurenberg.

Thursday's Proceedings.

There was a full attendance at the Salle de Fêtes, on Thursday, when Judge Gary again occupied the chair.

The meeting proceeded to the election of the following gentlemen constituting a committee to consider in what manner practical effect can be given to the views expressed by Judge Gary:

United States.

E. H. Gary, chairman, United States Steel Corporation, New York.
Willis L. King, vice president, Jones & Laughlin Steel Co., Pittsburg.
Charles M. Schwab, Bethlehem Steel Corporation, Bethlehem, Pa.
E. A. S. Clarke, president Lackawanna Steel Co., New York.
James A. Farrell, president United States Steel Corporation, New York.

Austria-Hungary.

A. Von Kerpely, manager, Osterreichisch Alpine Montangesellschaft, Vienna, Austria.
A. Trappen, director, Krainische Industrie Gesellschaft, Assling-Huette, Krain, Austria.
W. Kestranek, manager, Prager Eisenindustrie, Gesellschaft, Vienna, Austria.
Dr. Fried. Schuster, managing director, Witkowitzer Bergbau & Eisenhuetten Gewerkschaft, Vienna, Austria.
Dr. Paul Biro.

Belgium.

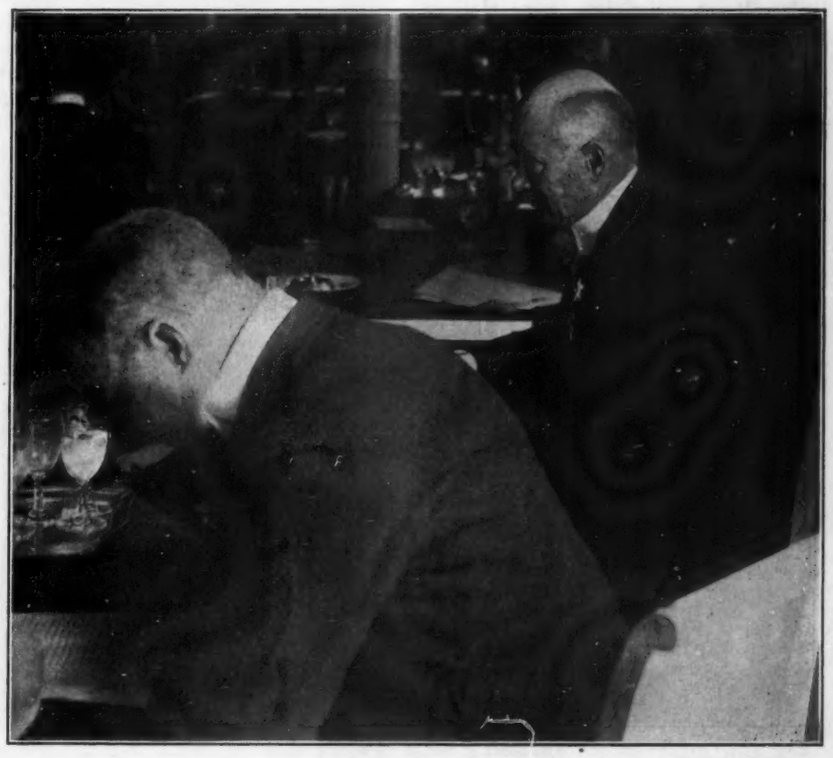
Jan Demoulin, Societe Metallurgique de Sambre et Moselle, Montigny sur-Sambre, Belgium.
Constant Renson, managing director, Societe Anonyme des Acieres d'Angleur, Tilleur, Belgium.
A. Greiner, director general, Societe Anonyme John Cockerill, Seraing, Belgium.
G. Trasenter, managing director, Societe Anonyme D'Ougree, Marihaye, Ougree, Belgium.
F. Lacanne.

Great Britain.

Sir John S. Randles, chairman, Mors Bay Hematite Iron & Steel Co., Ltd., Workington, England.
G. Scoby Smith, managing director, Bolckow-Vaughn & Co., Ltd., Middlesboro, England.
M. Mannaberg, Frodingham Iron & Steel Co., Ltd., near Doncaster, England.
Henry Steel Jr., director, Steel, Peech & Tozer, Ltd., Rotherham, York, England.
Arch. Colville, managing director, David Colville & Sons, Ltd., Motherwell, Scotland.

Canada.

T. J. Drummond.
J. H. Plummer.



BARON VON BODENHAUSEN AND JUDGE GARY

France.

Monsieur A. Dreux, Societe des Acieres de Longwy, Mont St. Martin, Meurthe-et-Moselle, France.
Th. Laurent, Cie. des Forges et Acieres de la Marine et d'Homecourt, St. Chamond, Loire, France.
M. R. de Lebrielle, director, Comptoir d'Exportation de Produits Metallurgiques, S. A., 32 Boulevard Hausman, Paris, France.
Mons. Pralon.
L. Charbonnel.

Germany.

D. Thyssen.
Reusch.
Dr. Schroedler.
Schaltenbrand.
Baron von Bodenhausen.

Russia.

M. Jasiukowicz, Societe Metallurgique Dnieprovienne du Midi de la Russe, Gorokhovaia 1, St. Petersburg, Rusia.
O. Bihet, Societe Metallurgique Russo-Belge, Jupille-Les Liege, Russia.
P. d'Arcy, Societe Metallurgique Russo-Belge, Jupille-Les Liege, Russia.

Spain.

Comte de Zubiria.

The committee appointed subsequently met and elected Judge Gary as chairman and Wm. B. Peat as secretary. The committee meeting then adjourned subject to the call of the chairman.

Received by King.

The above represents the whole of the matter supplied by the press committee.

The proceedings were very brief, and the actual business transacted by the full conference did not last more than half an hour. Lunch was partaken of at the Restaurant, and in the afternoon the delegates, all attired in regulation silk hat and frock coat, visited the Palais Royal, where they were received by King Albert, of Belgium. In the evening, there were one or two informal dinners.

Friday was given entirely to a trip arranged by the Belgian section with a view to exhibiting some of the natural beauties of the country.

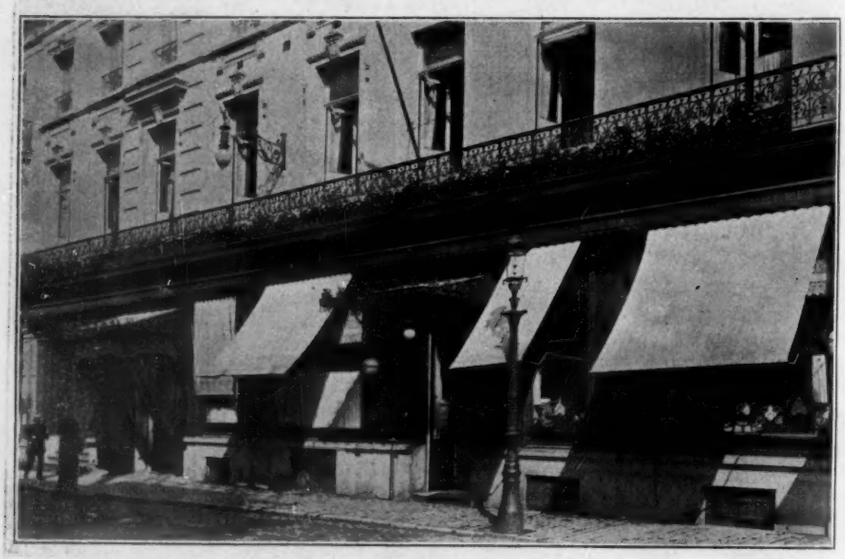
Fourth of July Dinner.

The account would not be quite complete without a further reference to the Fourth of July dinner, already referred to and which really owed its origin to the initiative of J. G. Butler Jr. It will be looked back upon by the American delegates as one of the most charming functions connected with the Brussels visit. The party comprised about 30, including the wives and daughters of the visitors, with a few "sisters, cousins and aunts". The speakers included Messrs. Butler, Campbell, King, Schwab, Clark, Felton and Drummond, and Baron von Bodenhausen was among the visitors. A quite unique incident was the arrival at a later stage in the evening of several of the Englishmen who happened to be holding a banquet in the same building. A number of them came into the room, including Sir Charles Allen, Sir Hugh Bell, William Peat, A. Cooper and others. They were naturally greeted with tremendous cheers. They were toasted, generally and separately, and while the Americans rejoiced over their independence of British rule, the Englishmen equally offered their congratulations. The element of humor gave a special piquancy to the speeches, which everyone fully appreciated.

Some Personal Impressions.

A few personal impressions may be added to supplement the somewhat meager account officially furnished. It is agreed on all hands that the conference has been a great success. Judge Gary was good enough to give to me at the close of the conference a hurried word expressive of his own appreciation. He said: "I am perfectly satisfied—abundantly so. The fact that the principal iron and steel makers of the world have met without any spirit of discord—on the contrary, with an effort to establish friendly relations, is an epoch in industrial life."

The representative character of the gathering has made a great impression. This is apparent from the names of the firms represented. Nothing need be said about the American representation, but as to England, the names of Sir John Randles and Sir Hugh Bell speak for themselves. In looking down the list, one could think of a few other names that might have been added. But such men as the Duke of Devonshire, who represent vast interests in Great Britain, took the opportunity of the London visit to give their blessing to the movement of international conciliation. The half flippant, half suspicious mood of the Englishmen before the meeting has already been suggested. It is due to Judge Gary to say that not only has this completely vanished, but that its disappearance is solely due to his personal influence. The change was wrought by the speech, in which the judge insisted on the social features of the association, and practically repudiated any intention to bind anybody by cast iron rules. The Englishmen really entertain a kind of fraternal regard for their American cousins, and they rather enjoy the prospect of an association which is non-technical and which must include a considerable share of social junketing in its program. In fact, they say "the more the merrier"; provided they are not bound up by the same rules as to price, conditions, etc., as their competitors in protected countries. Judge Gary has made it clear that for the present at any rate the relation is to be friendly, informative, consultative and social in its character. The conference has really been Judge Gary's conference, and by his vast personal influence and tactful management, has impressed himself upon the manufacturers of other countries, as a real Napoleon of business, with the addition of an idealism which fascinated men of the type of Sir Hugh Bell and others, who, on a smaller scale, have considerable aspiration in the social direction, coincidently with no small amount of business genius. There is a very general impression that a vast step forward has been taken, the result of which cannot yet be estimated, or scarcely dimly foreshadowed. The confidence of the Americans in Judge Gary appears to be unbounded, and it appears now that the Englishmen will be almost equally his admirers and disciples. It was a bright idea to prepare the way for the actual convention by the preliminary meetings in London, of which



Meeting Place of the Conference

Judge Gary took full advantage—so much so that his speech bears a strong family resemblance to the one he delivered at the Savoy hotel. His ideals, therefore, had had an opportunity to simmer, before being brought formally for business purposes in front of the general body.

A tribute really ought to be paid to the ideal weather kindly provided. The visitors were in luck in this respect. Apparently no discordant syllable was uttered and the convention really constituted a most happy family.

It is a pleasure to add some personal acknowledgment to the Americans in general and Judge Gary in particular for very kindly co-operation in the discharge of press duties which, under the circumstances, proved to be exceedingly onerous and difficult. The judge, in fact, was kindness itself. He and Mrs. Gary did not join the festive party on Friday, but left the Hotel Astoria early in the morning to proceed by motor to Paris. THE IRON TRADE REVIEW representative had the pleasure of a handshake and of wishing the judge "bon voyage" on his journey. It may be added that all of the Americans are highly pleased with the success of the conference.

Social Functions.

Brussels, July 4.

The visitors reached London on June 25, and since that time they have scarcely had a moment's interval in their activities. On Tuesday, June 27, after breakfasting at the Savoy hotel, where they made their headquarters, they took a motor trip though St. James park, Hyde park, Kensington gardens, Richmond, Bushey, and Hampton Court parks, Esher and Wisley, where they took lunch at Hutts hotel. In the afternoon they returned to the Savoy via Guilford, Leatherhead, Epsom, Wimbledon and Putney. The same evening, they witnessed a gala performance at His Majesty's theatre, when the king and queen attended, with a galaxy of notabilities, and the theatre was magnificently decorated. There was a brilliant performance of selections from "Merry Wives of Windsor," "Julius Caesar" and other famous plays. That occasion figured prominently as one of the most splendid functions in connection with the coronation festivities. On the following day, they paid a visit to Norwich, lunching on the train, and made a tour of the Royal Agricultural show, one of the great events of the year in Great Britain. The next day, special arrangements were made at the Savoy for the visitors to witness the royal progress through London, in which, in addition, the king and queen took part. In this as in every other event, special provision was made for the Americans, so that they had a perfect view of everything that took place. Friday, June 30, witnessed another hustling round of festivities and functions, which left the visitors fairly tired out. They left by special train for Shiplake, where the steam launches "His Majesty" and "Empress of India" were waiting to convey the party to Hurley Lock. Luncheon was provided in a marquee, after which they re-entered the launches and sailed for Maidenhead, one of the prettiest and most typical of riverside towns on the Thames, taking tea on board. Thence they

SIR HUGH BELL, LEAVING THE CONFERENCE

went in carriages to Taplow station to entrain for Paddington station. The evening was occupied with the most representative gathering of the week, commencing with a reception at the Savoy hotel by His Grace the Duke of Devonshire, and a banquet at which the duke, who is president of the Iron and Steel Institute, presided. The British visitors comprised practically all the representative men in the steel trade of Great Britain, and included Lord Furness, Lord Welby, Lord Pirrie, Lord Glantawe, Lord Goshen, Bonar Law, a well known politician, Sir Edgar Speyr, Sir T. Wrightson, Sir Hugh Bell, Sir Thomas Barclay and Sir W. H. White.

EXPORT SHIPMENTS

Of American Tin Plate Products Heavy—Standard Oil Contract.

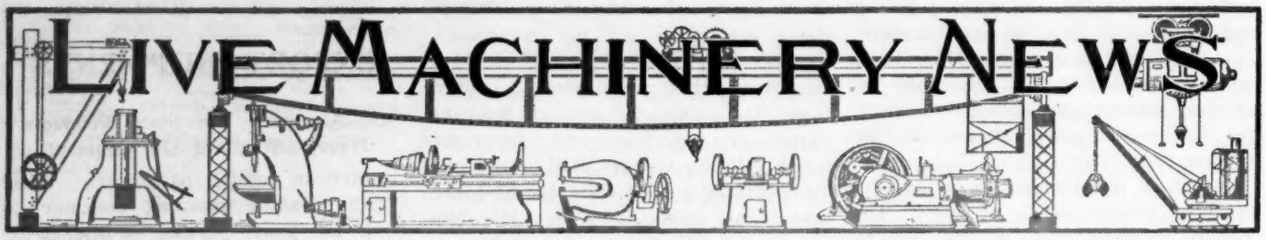
American mills, particularly those of the leading interest, continue to book the great portion of the re-export tin plate tonnage offered in this country and the movement of Welsh plate to the United States and Canada remains of very moderate proportions. One of the largest contracts of this nature taken early in the year and now being filled by the American Sheet & Tin Plate Co. is that covering the requirements of the Standard Oil Co. for the sealed products which it ships abroad. These requirements are estimated at from 1,200,000 to 1,500,000 boxes annually, or 5,000 tons or more monthly. Since the first of the year the leading maker has been shipping against this contract and only recently the commitment is understood to have been extended to cover the third quarter. Considerable American tin plate is also being shipped to China and the far eastern markets which in times past have been shared in heavily by the Welsh mills. As has been recently pointed out, the demand for tin plate in all the world's markets is active at the present time and the output of the Welsh makers is going to those consuming territories which offer them the largest proportion of profit and does not present the sharp competition for re-export orders which now prevails upon this side.

Hydraulic Machine Co. Taken Over

The Pittsburg Valve, Foundry & Construction Co., Pittsburg, has purchased all of the drawings, patterns, tools and good will of the Hydraulic Machine Co., of Pittsburg, for its Aiken hydraulic valves. The Pittsburg Valve, Foundry & Construction Co. has manufactured these valves for a number of years under a royalty arrangement with the late Henry Aiken.

Contract for Pipe

The Republic Iron & Steel Co. has received a contract for approximately 400 tons of 6-inch steel pipe for delivery in California. Several other fairly large inquiries are pending and the indications are that one or two awards will be made within the next week. Demand for merchant iron and steel pipe is only fair.



The Cleveland board of education has completed the preparation of the list of machine tools, woodworking, forge shop and other equipment, to be purchased for the proposed new technical high school to be erected in that city, and the list is now ready for distribution. It is expected that awards on the list will be made shortly after the closing of bids. Outside of this inquiry, there are no important issues in the Cleveland market, although sales for small lots continue fair. In New York, the New York Central railroad has again deferred action on bids which have been under consideration a month or more, and it is now believed that the postponement will extend into August; the New York market shows some activity in spots, but on the whole reflects no improvement. In Pittsburg, it is reported that the Pittsburg Crucible Steel Co. has closed for a portion of the equipment for its proposed plant at Midland, Pa., and it is expected that the entire list of equipment will be awarded very shortly. Pittsburg dealers report a larger volume of inquiry for light machinery and there is a good demand for electrical equipment; the transportation companies are displaying more interest in their requirements and the outlook in that direction is more favorable. In Chicago, there is a fair demand for all kinds of machinery. The Chicago & Alton railroad is in the market for machine tools.

Iron and Steel Works

Bar twisting machinery for the manufacture of reinforcing bars is to be installed in the plant of the Gadsden Rolling Mills at Gadsden, Ala., and other bar machinery is to be purchased.

The Union Steel Casting Co., Pittsburg, is building an extension to its present plant in Butler street and has awarded a contract to the Morgan Engineering Co., Alliance, O., for 14 electric traveling cranes ranging in capacity from 10 to 20 tons. The company will also install two 25-ton open-hearth steel furnaces.

Water Works

Bakersfield, Cal., will vote on bonds for the purchase and construction of a municipal water plant.

The Electric Water Co., Bakersfield, Cal., will build a plant at East Bakersfield and will lay mains.

The Huntington Beach Water Co., Huntington Beach, Cal., will build a water plant and lay mains.

The Western Water Co. will install a water system at Taft, Cal. Several thousand feet of pipe are among the requirements.

A bond issue of $75,000 is to be voted on by the municipality of Madisonville, Ky., for the purpose of building a system of water works.

The city of Erie, Pa., is having preliminary plans prepared for extensive improvements to the water works system of that city. Plans are being prepared by Chester & Fleming, engineers, Pittsburg.

The board of water supply, 165 Broadway, New York City, will receive bids up to Aug. 3, for 236 6-inch to 54-inch gate valves, 2 40-inch blow-off valves, two hydraulic cylinders for blow off valves, four hydraulic cylinders for 54-inch gate valves, bronze and cast iron piping and miscellaneous apparatus for delivery along the line of the Catskill aqueduct under construction in Ulster and Putnam counties, New York, and in Brooklyn.

Machine Tools

William R. Wiley & Co., of Roanoke, Va., are in the market for machine tools and other equipment for a small machine shop. A pump will also be required.

The board of education, Cleveland, is now taking bids on a large list of machine tools, bench and hand tools and supplies to be installed in the proposed new technical high school to be erected on the west side in that city. The present list includes only the equipment for the machine shops, the lists for the forge and other shops to be completed within the next two weeks. Besides specifications for 60 lathe chucks of various sizes, the list includes the following machine tools:

Two 14-inch x 6-foot motor driven engine lathes with compound rest and taper attachment.
One 14-inch x 5-foot, belt driven, tool room lathe, with quick change mechanism, compound rest, taper attachment, etc.
One 16-inch x 8-foot gap engine lathe, belt feed, compound rests, taper attachment.
One 14-inch x 6-foot cone driven engine lathe, belt feed, compound rests, taper attachment.
Eighteen 14-inch x 6-foot cone driven engine lathes, belt feed, compound rests, taper attachment.
Twenty-three 14-inch x 5-foot cone driven engine lathes, belt feed, compound rests, power cross feed.
Six 10-inch speed lathes with slide rest.
One 1¼-inch turret lathe with automatic chuck and wire feed.
One universal tool and cutter grinder.
One universal grinder.
Two 16-inch drilling machines, stationary head, wheel and lever feed.
One 20-inch drilling machine with sliding head, hand and power feed, automatic stop motion and tapping attachment.
Three sensitive one-spindle drill presses.
Two arbor presses.
Two twist drill grinders.
Four 14-inch shapers.
One 16-inch shaper.
Three 1½-inch, cone-driven, plain milling machines.
One 1½-inch universal milling machine.
Four 14-inch tool grinders, single wheel.
Two portable electric center grinders.
Two power hack saws.
One gas furnace.
One 24-inch x 6-foot planer.

New Works

The Easterbrook Pen Co. has plans under way for building a large factory at Camden, N. J.

The Forest City Electric Co., Windsor avenue and the C. & P. tracks, Cleveland, will erect a repair shop to replace the one recently burned.

The General Fire Proofing Co. is taking bids on two proposed new factory buildings to be erected at its expanded metal plant, Youngstown, O.

H. J. Hawkins, Downers Grove, Ill., is building a small brass foundry and is in the market for an oil-burning crucible furnace, crucibles, flasks and other brass foundry equipment.

The Johnson Van Vlaanderen Machine Co., builder of dyeing, printing, and finishing machinery, Paterson, N.

J., has secured a site in that city and will erect a five-story plant there.

The plant of the Lennox Machine Co., Marshalltown, Ia., which was recently damaged by fire, will be rebuilt, although probably not at Marshalltown. This company is controlled by Joseph T. Ryerson & Son, Chicago.

The Pomona Mfg. Co., Pomona, Cal., a manufacturer of deep well pumps, traction engines, etc., is planning to make a number of extensions to its plant, and it is reported will install a large amount of new machinery.

It is reported that a structural iron plant will be erected at Atlanta, Ga., by the Virginia Bridge & Iron Co., of Roanoke, Va., which plans, in addition to the main buildings, a machine shop, templet shop, powerhouse, etc.

The Massillon Bridge & Structural Co., Massillon, O., advises that its new shop will be 600 x 143 feet, with crane runways at each end 400 feet long. An entire new power plant will be installed although a quantity of equipment from the present plant will be used.

Leenhouts & Guthrie, Milwaukee, architects, are preparing plans for a $50,000 manufacturing addition to be erected by the Chain Belt Co. It will be two stories high, 250 x 80 feet, of brick and steel construction. Elevator castings and concrete mixers will be manufactured in it.

The New York Central Iron Works Co. has plans for establishing a plant at Hagerstown, Md. Included is a main shop building, 80 x 250 feet; a railroad track equipped with two electric traveling cranes, and an electric power house for operating the plant. D. E. Dempsy is president, with main office at Geneva, N. Y.

The Newark Automobile Mfg. Co. has secured a site on Bigelow street, Newark, N. J., and will erect a factory, 75 x 100 feet, for manufacturing industrial trucks. It is expected that the company will shortly complete a list of general tool equipment. Joseph J. Rafter, 800 Broad street, Newark, is president of the company.

The contract for constructing the new buildings to be erected at the plant of the Manning Sand Paper Co., Watervliet, N. Y., has been awarded to Lewis A. Miller, Meriden, Conn. The plans call for one building, 95 x 100 feet, three stories high; one, 50 x 60 feet, five stories, and a boilerhouse, 30 x 46 feet, one story; all of brick, and of heavy mill construction.

The Blaw Collapsible Steel Centering Co., manufacturer of the Blaw patented steel centers for general concrete work, with main office at Pittsburg and warehouse and works at Reynoldsville, Pa., will extend its scope of operations and is enlarging its plant. The company is erecting a new building, 200 x 50 feet, and installing new machinery. When the improvements are completed, the company will engage in a general line of light fabrication work.

Power Plant Equipment

El Modena, Cal., is considering the installation of a municipal electric light and power station.

The Bemmels Milling Co., Lisbon, N. D., is considering the erection of an electric lighting plant in that city.

Clarkville, Ark., is having plans drawn for the construction of an electric lighting plant to cost $20,000.

David Getaz, Son & Co., Knoxville, Tenn., are asking for prices on engines, generators and other equipment.

E. B. Griswold, Cotter, Ark., who was recently granted a 30-year franchise by the city council, will install an electric lighting plant.

Plans have been completed by John T. Windrim, Philadelphia, for a power plant, to cost $50,000, to be erected by the Philadelphia Electric Co

A 30-year franchise has been granted to the Mexico Power Co., Mexico, Mo., for a central heating plant, which is to be installed this summer.

The city engineer, Fort Collins, Col., has been instructed to draw up surveys and estimates for a proposed municipal electric lighting plant.

The Shawnee Gas & Electric Co., Shawnee, Okla., will rebuild its power plant, which recently suffered damage to the amount of $150,000 through a fire.

Passaic, N. J., has decided to engage an engineer for the purpose of estimating the cost and drawing plans for a proposed municipal lighting system.

J. M. Ross, Somerset, Ky., is in the market for power equipment and transmission machinery to be used in manufacturing a machine for making railroad cross-ties.

It is reported that the Indianapolis, Chicago & Meridian railway, M. J. Moreland, president, Indianapolis, Ind., will build new power stations at Monticello and at Indianapolis.

Bids are being taken by W. S. Sargent, city clerk, New Lisbon, Wis., for the construction of an electric light and water plant. A. H. Meyer, Appleton, Wis., is consulting engineer.

Several electric elevators will be installed in a building which is to be erected in Louisville by the Norton Co. The site at Fourth and Market streets is now being razed.

Bids will be received until July 24 by J. C. Armstrong, borough clerk, Etna, Pa., for the necessary buildings, machinery, lamps, etc., for the proposed new borough light plant.

Bids will be closed July 27, for the construction of an electric light plant and water works system at McKenzie, Tenn. C. H. Jenks, Union City, Tenn., is the engineer in charge.

The Norwich Pharmacal Co., Norwich, N. Y., will erect a power house, 40 x 80 feet, of brick and concrete, at its present plant. F. L. Comstock, architect, Gloversville, N. Y., prepared the plans.

The Consolidated Gas, Electric Light & Power Co., Baltimore, is completing plans for the construction of a large addition to its plant at the foot of Leadenhall street. Estimated cost, $100,000.

The village board of trustees, Barker, N. Y., have granted a 50-year franchise to the A. L. Sweet Electric Light & Power Co., Medina, N. Y., to construct and operate an electric light and power system.

The quartermaster of the Madison Barracks, New York City, will receive bids up to July 27, for the removal of the old and the installation of five new boilers in the officers' quarters at the post.

An air compressing outfit and other equipment will probably be needed by the Bluegrass Fluorspar Co., which has been organized at Mexico, Ky. R. C. Haase is general manager of the company.

The board of education of Louisville is in the market for heating and ventilation plants, the estimated cost of which is $18,000. Bids are to be received within the next few weeks by Sam Jones, business director.

It is reported that S. Cheney & Son, Manlius, N. Y., have under consideration plans for abandoning the use of steam power, and replacing with electric motor drive equipment. The change will probably be made by the end of the year.

Brown & Lowe, Schénectady, N. Y., have been awarded the contract covering the construction of a power house, 60 x 90 feet and four stories high, to be erected at East Creek, N. Y., for the East Creek Light & Power Co. The estimated cost is $50,000.

J. B. Speed, F. M. Sackett, I. P.

Barnard and others, Louisville, will develop coal properties owned heretofore by the Edgemont Coal Co. and located in eastern Kentucky. They will be in the market for power equipment and other machinery.

Condensers, cooling towers, transformers and power equipment of various kinds will be required by the Anderson, S. C., Water, Light & Power Co., which is to install a $50,000 steam turbine plant for the purpose of increasing its capacity by 1,600 horsepower.

The Des Moines City Railway Co., Des Moines, Ia., has announced that an addition to the power house on East Maple street, will be constructed and equipped with a 2,000- kilowatt, low pressure turbine, together with the necessary condensers, switchboard and transformers. A 500-kilowatt rotary converter will be located at Flint Junction and a 300-kilowatt converter will be installed near Grandview park. A new coal and ash conveying plant and an electrically-operated 30-ton crane will be installed at the power station.

Considerable power plant machinery and boilers will be required for the new office buildings now being erected in Chicago. Among the buildings under erection, or for which structural contracts have already been let, are the Insurance Exchange building, the Federal Life Insurance building, the Otis Bank building, the Rand-McNally building, and the new department store for Rothschild & Co. Each of these structures will require a large amount of machinery, principally engines, boilers, generators, motors and elevator apparatus.

Miscellaneous

The Copper Reef Mining Co., Globe, Ariz., will install a compressor.

The department of public service, Milwaukee, is about to take bids on a hoist to be installed at the refuse incinerator.

Lt. Col. W. W. Gibson will receive proposals up to Aug. 9, for the construction of an addition to the gun shop at the Watervliet Arsenal, N. Y.

The Vincennes, Washington & Eastern Traction Co., Vincennes, Ind., has increased its capital stock from $100,000 to $600,000 and will probably make improvements.

The director of public service, Cleveland, will receive bids until July 27, for a crane framework and track to be delivered at the Kirtland pumping station of the water department, that city.

Orders have been received at the Mare Island navy yard to commence work on the repairs to the cruiser South Dakota; $50,000 will be spent in installing new cage masts and a magazine sprinkling system.

Professor W. J. Grimes will have charge of the newly established manual training department of the Willows, Cal., high school. A complete set of bench tools and a few machine tools are to be purchased.

The Beredelli Construction Co., Fairmont, W. Va., has been awarded a contract to build 14 miles of the Waynesburg & Blackville electric line, which will eventually connect Fairmont, W. Va. and Pittsburg.

The Pittsburg Crucible Steel Co. is understood to have awarded some contracts for equipment for the new plant at Midland, Pa., and it is expected that most of the awards will be made within the next 10 days.

The Gunther Hardware Co., Inc., Quincy, Ill., whose plant was badly damaged by fire, advises that it is desirous of securing catalogs and price lists from manufacturers of builders' hardware, etc., in order that it may immediately replace its damaged stock.

The Boone Electric Co., Boone, Ia., has awarded a contract to Allis-Chalmers Co., Milwaukee, for two 1,000-kilowatt turbines and has ordered three 400-horsepower boilers from the Edge Moor Iron Co. Other improvements to the plant of this company are contemplated.

Tate, Jones & Co., Inc., Pittsburg, have received orders for a new type of heat treating furnace from the Pacific Tool & Supply Co., Erie City Iron Works, Keystone Steel & Wire Co., Rogers Shear Co., the Simplex Motor Car Co., Mattatuck Mfg. Co. and M. Hoagland & Sons Co.

Among orders for industrial locomotives recently taken by the Lima Locomotive & Machine Co., 50 Church street, New York, are the following: One 50-ton Shay, sold to the Tomkins Cove Stone Co.; one 50-ton Shay sold to the Woodstock Lumber Co.; one 42-ton Shay for shipment to Chile.

Government News

Navy Supplies.

Bids will be opened Aug. 1, by the bureau of supplies and accounts, Navy department, Washington, D. C., for furnishing and delivering at various navy yards supplies:

Anchors, boat, 12, Norfolk, 3775.
Crucibles, plumbago, 65, Brooklyn, 3776.
Kettles, copper, 5, Brooklyn, 3773.
Blocks, chain, miscellaneous, Brooklyn, 3775.
Drills, twist, 1,260, Brooklyn, 3775.
Rivets, steel, 4,000 pounds, Norfolk, 3775.
Screws, machine, miscellaneous, Philadelphia, 3775.
Screws, wood, miscellaneous, Philadelphia, 3775.
Screws, wood, miscellaneous, Brooklyn, 3775.
Brass, naval, round, 1,500 pounds, Philadelphia, 3776.
Brass, sheet, miscellaneous, Brooklyn, 3776.
Bronze, plate, 7,000 pounds, Brooklyn, 3774.
Steel bar, 5,400 pounds, Brooklyn, 3774.
Steel, medium, plate, miscellaneous, Brooklyn, 3774.
Steel, medium, plate, 2,500 pounds, Brooklyn, 3776.
Pipe, lead, miscellaneous, Norfolk, 3774.
Pipe, wrought iron or steel, 14,000 feet, Brooklyn, 3774.

The navy department has postponed from July 18 to July 25, the opening of bids on schedules 3731 to 3743, and bids should be withheld accordingly. These schedules include the following:

3731, bolts, tracks, frogs, switches, steel rails, etc., for Charleston; 3732, Tobin bronze, armor plate, steel forgings, etc., miscellaneous; 3733, shell bands, fire brick, for Washington; gyro gears, fuel filling funnels, torpedo deck trucks and copper tubing for Newport; 3735, steel bolts and nuts, galvanized buckets, machine screws, for Brooklyn; 3739, brass rod and copper tubing, for Brooklyn; 3740, steel oil tank for Philadelphia, hand tools and shaper vise for Brooklyn.

Following is the scale of offers received by the bureau of yards and docks, Navy department, for furnishing boilers and accessories, auxiliary power plant, equipment, piping, etc., for the naval station at Pearl Harbor, Hawaii:

1. Evans, Almiral & Co., New York, $167,000; for item 2 add $350.
2. M. L. Bayard, Philadelphia, $158,000. for item 2 add $600. Conditionally, deduct $4,000, add $1,000, deduct $600, add $2,500.
3. Von Hamm-Young Co., Ltd., Honolulu, T. H., $169,182.57; for item 2 add $262.50. Conditionally deduct $3,550.
4. Charles C. Moore & Co., San Francisco, $158,000; for item 2 add $500. Conditionally, deduct $2,878, $1,000, $5,000, $4,500, $500, $2,000, $250, add $500.

John W. Danforth Co., Buffalo, $153,495; for item 2 add $550. Conditionally, deduct $4,000, add $2,000, $2,500, $1,050, $1,500, deduct $6,000. Alternate bid, $147,500.

Cableways for Rio Grande.

Director F. H. Newell, of the reclamation service, will open bids July 21, at 2 p. m., for furnishing at the works of the bidder, three cableways, span for each about 1,420 feet; cableways designed to operate Andresen-Evans type B thre-yard heavyweight grab buckets weighing 10,000 pounds each (to be furnished by the U. S.); cable hoists to be electrically operated with three-phase, 60-cycle, 2,200-volt alternating current, with 300-horsepower crane type motor. Proposal blanks and specifications for the work, known as "Cableways for the Rio Grande," will be furnished upon application to the director, reclamation service, Washington, D. C.

Canal Circular 640.

The isthmian canal commission will open bids, Aug. 4, for furnishing one turbo-generator unit, 500 kilowatts; one road roller, 500-ton; 25,000 elec. water hose, and 30,000 creosoted cross ties.

D. C. Boilers.

The commissioners of the District of Columbia will open bids July 24, at 2 p. m., for the replacing of two condemned boilers in the basement of the Eastern high school. Specifications and all necessary information will be furnished by the chief clerk of the engineer department, Room 427, District building, Washington, D. C.

The county court of Obion, Troy, Tenn., has completed plans for the construction of several steel bridges in that county, and will advertise for bids in the near future.

(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

New Buyers

The following manufacturing companies have filed articles of incorporation:

United Engineering Co., Toledo; $10,500; by Earnest Truman.

The Stephens Sub-soil Plow Co., Little Rock, Ark.; $25,000; by H. W. Hennegin, W. A. Stephens and G. W. Hendricks.

The Langer Auto Castings & Foundry Co., Chicago; $7,000; by Conrad P. Langer, Joseph Van Cranenbroeck and John Holland.

The Schwartz Iron & Machinery Co., New Orleans, La., $10,000; by Moses Schwartz, Walter B. Schwartz, and Otto B. Schwartz.

The Novelty Tool Co., North Vernon, Ind.; $10,000; to manufacture tools; by H. H. Dowd, Henry Dicks and others, of North Vernon.

The Cleveland & Erie Machinery Co., Cleveland; $10,000; by G. H. Williams, Wm. Ruddock, C. C. Williams, E. P. Lord and S. C. Edwards.

The North Indiana Bridge Co., Michigan City, Ind.; $40,000; to fabricate bridges and structural work; by J. J. Jackson, S. S. Roby and E. D. Church.

North Manchester Foundry Co., North Manchester, Ind.; $10,000; to conduct a foundry and machine shop; by J. C. F. Martin, John Stauffer and W. J. Ranger.

Schneider Sales Co., Chicago; $5,000; to manufacture and deal in tools, machinery and appliances; by Casper J. Schneider, Lester E. Lee, and Sidney E. Levy.

The Forse Mfg. Co., Pendleton, Ind.; automobile accessories; $25,000; by W. H. Forse Jr., R. M. Allen, Linfield Myers, Fred Lantz, D. B. Cole and Austin Retherford.

E. G. T. Colles & Co., Chicago; $50,000; to manufacture and deal in filters, water stofteners and other mechanical devices; by James V. Hickey, George D. Kimball and G. E. Kerr.

The Rotary Hoisting Engine Co., Owensboro, Ky.; $100,000; by Roy Gilbert and three brothers; to manufacture a new type of engine, for which the company has the American rights.

The United States Aerial Navigation Co., Ridgefield Park, N. J.; $1,000,000; by Bruce H. Schmidt, Frederick J. P. Henke and Edward E. Whittaker; to manufacture aeroplanes, flying machines, etc.

The Iowa Valve Co., Oskaloosa, Ia.; $100,000; to take over the old plant of the Iowa Mfg. Co.; by B. N. Boss, Des Moines, Ia., president; W. W. Corey, St. Louis, vice president and general manager; Herman Reed, Oskaloosa, treasurer.

The Alloy Steel Casting Co., Wheeling, W. Va.; $100,000; building and operating furnaces and other devices for melting, reducing and pouring metals; casting or melting steel, iron, etc.; by W. N. Carr, A. S. List and S. M. Noyes, all of Wheeling.

New Construction

The National Machine Co., Milwaukee, Wis., will erect an addition to its plant, the cost of construction of which will be $10,000.

Equipment for the new merchant bar mill of the Lackawanna Steel Co., Buffalo, is now being set up and it is expected that the new capacity will be ready for operations sometime during the month of August.

The Virginia Bridge & Iron Co., Roanoke, Va., will double its Atlanta, Ga., plant, and for this purpose has secured a 4-acre site in that city. The company is also enlarging its plants at Roanoke, Memphis and New Orleans.

A steel structure will replace the kiln at the Edgar zinc smelter, Cherryvale, Kan., a subsidiary of the United States Steel Corporation, which was destroyed by fire about two weeks ago. The material has been ordered, and work will be started in a few days.

Extension of the foundry of the Root & Van Dervoort Engineering Co.'s plant at Moline, Ill., has been authorized by the officials of the company, and ground is already being broken in order to commence the work. The extension will be 70 x 150 feet and will cost approximately $30,000.

The Massillon Bridge & Structural Co. advises that its new shop will be 143 x 600 feet, with crane runways at each end 400 feet long. An entirely new power plant will be installed, but most of the equipment will be taken from the present shop. The capacity of the company will be about 1,000 tons per month.

It is announced by the Lennox Machine Co. that its plant, which was recently damaged by fire, as mentioned in the Daily Iron Trade Review, July 11, will be rebuilt as soon as possible, although probably not at Marshalltown. Sufficient stock and finished machines were saved from the fire to take care of all immediate requirements and to fill orders promptly during the reconstruction period.

The Warner Instrument Co., Beloit, Wis., manufacturing automobile speedometers, mileage recorders, electrical devices, etc., has commenced work on the construction of a new brass foundry. It will have dimensions of 32 x 50 feet and will be one story. The present brass foundry will be devoted to other purposes and all foundry work will be concentrated in the new building. William Fitzgerald of Beloit has the contract for the construction work.

General Industrial

The Wabash Iron Co., Terre Haute, Ind., has filed notice of its dissolution.

The Terre Haute Iron & Steel Co., Terre Haute, Ind., has filed notice of its dissolution.

The Cross Gear & Engine Co., Detroit, has increased its capital stock from $20,000 to $80,000.

The Allegheny Steel Co. has approved the proposition to increase its capital stock from $3,000,000 to $3,500,000. The new stock will be issued immediately.

The Chicago Iron & Metal Co. has purchased property on Turner avenue, Chicago, frontage 25 x 124 feet, the price being $7,000. The site will be used for extension purposes.

The Cleveland-Cliffs Iron Co. has closed down its Lucy mine at Negau-

nee Mich., and its Crosby mine at Naswauk. The company is at present operating but five of its fleet of ore vessels.

Franz Warner, architect, has awarded the contract for about 400 tons of structural steel for the proposed addition to the Colonial hotel, Cleveland, to the National Iron & Wire Co., Cleveland.

The Minneapolis General Electric Co. has declared a semi-annual dividend of $3 on its preferred stock, and a quarterly dividend of $1.75 on its common stock, both payable Aug. 1, to stockholders of record July 18.

The Zanesville Mfg. & Supply Co., Zanesville, O., advises that at present it expects to manufacture principally malleable pipe fittings, but will have other lines later on. No new buildings will be erected and all equipment has been ordered.

A special meeting of the shareholders of the Standard Pressed Steel Co., Philadelphia, will be held Aug. 26, to vote upon a proposed increase in the capital stock from $100,000 to $175,000, to consist of $40,000 common and $35,000 preferred.

The Southern Brass Mfg. & Plating Co., Houston, Tex., has re-organized with W. S. Farish, president; T. C. White and W. W. Fondren, vice presidents, and G. C. Staiti, secretary-treasurer. No new buildings will be erected at present. The company recently increased its capital stock to $24,000.

The C. S. Card Iron Works Co., Denver, Colo., advises that it has moved into its new shops on Alcott street, thereby largely increasing its facilities. The new plant consists of a foundry and forge, sheet iron, machine and car shops. Coal and mine equipment will be manufactured exclusively.

The Gunther Hardware Co., Inc., Quincy, Ill., advises that its stock was totally destroyed by fire, June 24, with a loss of $30,000. The company is desirous of securing catalogs and price lists from manufacturers of builders' hardware, etc., in order that it may immediately replace its damaged stock.

The Virginia Bridge & Iron Co., Roanoke, Va., will double the capacity of its present plant and for this purpose has leased a four-acre site at East Point, Va., near Roanoke. The new plant will consist of main shops, machine shop, templet shop, power house, storage building, etc., all of which will be of steel construction.

The Tilden Saw & Mfg. Co., Wyandotte, Mich., advises that its increase in capital stock recently noted, was made to finance the taking over of the Campbell Mfg. Co., Wyandotte. The building of the latter company, 60 x 170 feet, two stories, is valued at $30,000 and contains $10,000 worth of machinery. It will hereafter be operated by the Tilden company.

J. P. Kemp, manufacturers' representative, advises that his business will hereafter be conducted as the Kemp Machinery Co., with headquarters at 19 East Lombard street, Baltimore. Associated with J. P. Kemp will be S. V. Kemp, who has had a wide experience in mechanical engineering work. The company will specialize in machine tool equipment, but is prepared to supply nearly all requirements for machine, boiler and wood working plants. The following concerns will be represented: The Lodge & Shipley Machine Tool Co.; the Cincinnati Milling Machine Co.; the Cincinnati Bickford Tool Co.; the Cincinnati Planer Co.; the Colburn Machine Tool Co.; Acme Machine Tool Co.; Mechanics Machine Co.; Gould & Eberhardt; the Lea Equipment Co., and the Loew Mfg. Co.

Trade Notes

Charles H. Kellerman, of the Barr & Kellerman Foundry Co., 473 W. Erie street, Chicago, has purchased the interests of Robert C. Barr, his partner in the business, for $30,000.

The old plant of the Iowa Mfg. Co., Estherville, Mo., has been taken over by the Iowa Valve Co., of Oskaloosa, Mo., which was recently incorporated with a capital stock of $100,000.

The Mathews Gravity Carrier Co., St. Paul, Minn., has established a factory at 28 Sheppard street, Toronto, for the manufacture of a complete line of gravity carriers and automatic elevators for different classes of factories.

C. T. Roberts, Crystal Falls, Mich., has acquired control of Lot 3 mine from the International Harvester Co., and expects to dispose of the property inside of 30 days. The ore in Lot 3 mine carries a higher manganese content than is desirable for the Harvester company's purposes.

The Sprague Electric Works of the General Electric Co., New York City, announces that James A. Clifford, manager of the Baltimore office, has been appointed manager of the Philadelphia office. Henry S. Patterson will be in charge of the Baltimore office, while Frank W. Hall, former manager of the Philadelphia office, has been appointed manager of hoist sales with headquarters at 527 West Thirty-fourth street, after July 15.

The Wheeling Corrugating Co., Wheeling, W. Va., manufacturer of sheet metal and sheet metal products, will open a branch office and warehouse at Tenth and Hickory streets, Kansas City, Mo., Sept. 1. The branch will be in charge of H. J. Morgan, who has been assistant manager of the company's plant at St. Louis. This is the sixth of a chain of distributing stations that the company is installing throughout the country.

The American Auto Trimming Co., Detroit, has established a branch plant at Walkerville, Ont., and will be known as the American Auto Trimming Co., Ltd., of that place. The new branch is a separate organization, however, incorporated under the laws of Ontario, and the business carried on will be the painting and trimming of automobile bodies and the making of tops. A factory building covering about 60,000 square feet of floor space will be erected. The officers of the new company are: Benjamin Gotfredson, president; Frank H. Joyce, vice president, and D. O. Goudie, secretary.

Fires

Fire recently damaged the Rotary Washing Machine Co.'s plant, at St. Louis, the loss being estimated at $25,000.

The S. L. Clark machine shop at Black Rock, Ark., was damaged to the extent of several thousand dollars by fire last week.

The Raul Brothers machine shop, Helenville, Wis., was struck by lightning July 7, and damaged to the extent of $10,000.

The Humphrey Machine Co., of Keene, N. H., was destroyed by fire July 8, the loss being estimated at $15.000. The blaze was the result of a fierce electric storm, lightning setting fire to the Impervious Packing Co.'s plant, which spread rapidly to the Humphrey buildings adjoining it.

The United Iron Works Co.'s molding, foundry and pattern rooms at Springfield Mo., were damaged by fire to the extent of $35,000 last week. The company, however, will reopen its shop at Aurora, Mo., and handle the work in that plant that has formerly been handled in Springfield until the latter plant has been rebuilt. No interruption in business will therefore be necessary.